

**UK MET OFFICE
GLOBAL DATA MONITORING REPORT**

December 2004

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Exeter. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Exeter in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1 and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Exeter and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Exeter and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of $>60 \text{ m s}^{-1}$ have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference $> 60 \text{ m s}^{-1}$ have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure Parameter

4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Exeter and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5 , then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbiting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbiting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature, for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbiting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Exeter during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Exeter in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Exeter from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics (**Geopotential Height and Windspeed at 100 and 500 hPa**) for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.
27. November 2003. Included temperature and relative humidity statistics for ships, fixed buoys and platforms in Table 1.
28. November 2003. NOAA 17 statistics no longer available due to malfunction of the AMSU-A instrument.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures		
Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for ships, fixed buoys and platforms.	
Standard of comparison	:Background field from UKMO global model.	
Observation times	:All hours	
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (Degrees). :Air temperature (Degrees C). :Relative Humidity (%). :Sea surface temperature (Degrees).	
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. a positive bias indicates the wind observation is veered to the background.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa (pressure) :25 m s^{-1} (vector wind) :15 degrees (air temperature) :10 degrees (sea surface temperature)	
SELECTION CRITERIA	:NOBS	≥ 20 , and one or more of the following:
	1. bias	≥ 4 hPa (pressure), $\geq 5 \text{ m s}^{-1}$ (wind speed), ≥ 30 degrees (direction). ≥ 3 degrees (sea surface temperature). ≥ 4 degrees (air temperature) $\geq 15\%$ (relative humidity)
	2. SD	≥ 6 hPa (pressure), ≥ 80 degrees (direction). ≥ 5 degrees (sea surface temperature). ≥ 6 degrees (air temperature) $\geq 25\%$ (relative humidity)
	3. PGE	≥ 25

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CF3	P	30	0	33	0.9	-5.6	5.7
A8FA5	P	34	0	0	1.1	5.2	5.3
ELRR2	P	29	28	41	4.5	-0.4	4.5
ELWD5	P	34	3	6	2.0	4.2	4.6
ELWO6	P	54	0	39	1.2	-4.3	4.4
FNYP	P	48	0	13	1.0	-4.2	4.3
UDBK	P	21	62	95	9.5	2.0	9.7
UDWH	P	29	38	45	2.6	0.1	2.6
UDYG	P	61	0	80	1.1	-7.2	7.3
UDYN	P	88	17	97	7.1	-1.2	7.2
UFAA	P	24	50	100	1.5	13.6	13.7
VRZK9	P	26	0	8	1.8	6.0	6.3
WADZ	P	69	1	100	6.1	1.6	6.3
WCY7054	P	24	0	21	1.3	6.1	6.2
WSRH	P	40	0	5	2.6	-4.4	5.2
ZCDF8	P	65	0	35	0.9	-4.7	4.7
4XIS	P	43	0	0	1.1	4.6	4.7
42046	P	704	0	79	0.5	4.0	4.1
62140	P	25	8	92	3.1	-8.4	8.9
62166	P	46	0	100	4.4	5.3	6.8

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CJ9	SPEED	35	3	34	5.1	8.5	9.9
ELZT3	SPEED	446	13	41	5.6	6.3	8.4
FNCI	SPEED	95	22	71	6.3	6.3	9.0
HOKP	SPEED	21	0	10	2.9	6.6	7.2
HPNE	SPEED	47	0	17	3.6	5.3	6.4
LACF5	SPEED	44	0	45	3.4	7.1	7.9
LALK4	SPEED	42	0	31	5.2	9.4	10.8
SCKM	SPEED	30	0	100	5.2	6.1	8.0
UCOO	SPEED	27	0	52	4.3	5.8	7.2
UDYN	SPEED	89	3	87	4.8	5.9	7.6
VEP717	SPEED	218	0	5	4.4	6.0	7.4
VRUR7	SPEED	51	10	31	7.9	6.9	10.5
VVKV	SPEED	40	0	2	3.1	5.7	6.5
V2IA	SPEED	67	1	66	5.0	5.4	7.4
V7CY4	SPEED	30	0	3	3.4	5.0	6.1
ZCDG7	SPEED	135	0	15	5.0	6.4	8.2
3ERW2	SPEED	37	8	43	4.2	8.1	9.1

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CGJK	DIRN.	49	0	0	26.6	-46.4	53.5
ELVZ7	DIRN.	43	0	0	33.0	-33.9	47.3
FNCI	DIRN.	72	29	0	88.8	49.2	101.6
ZCBZ4	DIRN.	24	4	0	42.5	-36.1	55.7
42013	DIRN.	60	0	0	71.4	-67.4	98.1
52083	DIRN.	174	0	0	95.3	-34.8	101.5
62116	DIRN.	622	0	0	11.9	33.4	35.4

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
CYLY	T	23	0	100	2.5	7.6	8.0
ELWC5	T	46	0	100	2.8	4.2	5.0
SP33	T	115	0	100	4.3	-6.9	8.2
UCJJ	T	113	0	100	3.4	-4.4	5.6
UCOY	T	31	26	100	7.6	-4.6	8.9

WCW9126	T	286	2	100	3.1	6.3	7.0
WWU8	T	25	20	100	3.4	8.4	9.1
46081	T	717	2	100	3.4	6.8	7.6
46131	T	711	0	100	2.0	5.2	5.5
46146	T	714	0	100	1.7	5.1	5.3
46181	T	710	0	100	2.9	4.0	5.0
IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8DO9	RH	30	0	100	7.2	18.5	19.8
C6NR7	RH	27	0	100	6.7	16.7	18.0
ELUX2	RH	58	0	100	16.9	16.7	23.8
FNAT	RH	64	0	100	5.7	24.7	25.3
FQFL	RH	131	0	100	7.1	-17.8	19.2
HPEU	RH	32	0	100	9.0	20.6	22.5
VRYS8	RH	31	0	100	8.0	16.2	18.1
ZSWAV1	RH	21	0	100	10.1	-33.2	34.7
3EBX6	RH	41	0	100	17.2	-31.2	35.6
3FMM6	RH	47	0	100	6.7	15.2	16.7
62140	RH	25	0	100	7.7	19.4	20.9
IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
A8CR6	SST	43	0	86	2.1	3.3	3.9
C6KJ5	SST	69	0	33	2.1	3.4	4.0
C6QF4	SST	46	48	78	1.8	4.8	5.1
C6RJ6	SST	48	0	8	0.8	-3.0	3.2
DAJL	SST	30	0	100	0.8	3.0	3.1
ELYP7	SST	82	7	70	1.9	-3.2	3.8
HPZR	SST	55	0	91	1.2	4.5	4.7
KHRC	SST	42	0	100	0.8	-3.4	3.5
KHRP	SST	40	0	100	0.7	3.1	3.2
KRGB	SST	338	36	96	2.2	-2.6	3.4
LAWO2	SST	21	5	52	3.2	4.2	5.3
PHSG	SST	25	0	100	0.7	-3.9	4.0
UBAM	SST	31	0	100	1.2	5.3	5.4
UCJO	SST	28	0	82	1.8	-4.2	4.6
V2AC6	SST	26	0	100	1.2	3.4	3.7
V2EU	SST	26	0	38	1.5	-3.3	3.6
V7BW7	SST	33	3	58	2.0	-4.5	4.9
WAAH	SST	46	0	100	1.3	3.4	3.6
WCZ5528	SST	54	0	83	2.5	-4.2	4.9
WCZ9703	SST	55	0	47	2.5	-3.0	3.9
WSRH	SST	35	0	100	1.1	-3.2	3.4
3EMQ9	SST	48	0	100	0.8	-3.6	3.6
3ERW2	SST	33	3	55	2.4	3.9	4.6
3FPA6	SST	56	0	98	0.9	6.2	6.3
31055	SST	216	0	81	0.6	-3.5	3.5
42021	SST	400	0	93	1.0	-4.9	5.0
42035	SST	683	0	38	1.2	-3.0	3.2
44141	SST	678	0	85	1.1	-3.1	3.3
44161	SST	303	0	100	0.4	-3.8	3.8
9HCH7	SST	30	7	100	0.8	3.6	3.7

Figure 1. SHIP/SYNOP mean daily count. DECEMBER 2004
All hours
Global average number of observations in 24 hours = 20154

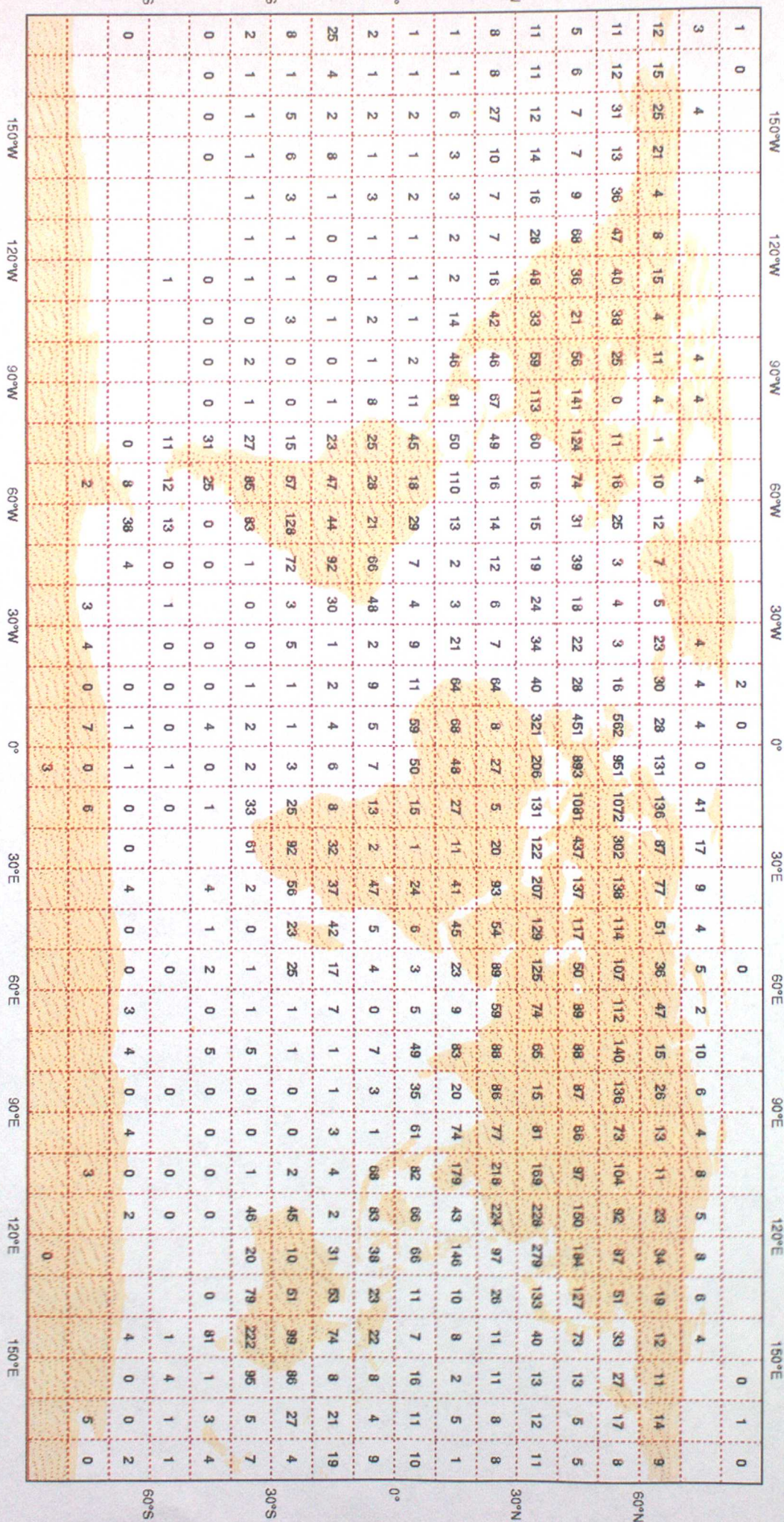


TABLE 2

**MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: EXETER
MONTH: Dec 2004**

Monitoring procedures

Period	:One calendar month.	
Data monitored	:Reports from each unique identifier for drifting buoys.	
Standard of comparison	:Background field from UKMO global model.	
Position	:Average latitude and longitude for period.	
Observation times	: All hours	
Elements monitored	:Mean sea level pressure (hPa). :Wind speed (m s^{-1}). :Wind direction (degrees). :Sea surface temperature (degrees).	
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	: Percentage of observations flagged excluding those with gross errors
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. a positive bias indicates the wind observation is veered to the background.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa :25 m s^{-1} :10 degrees	(pressure) (vector wind) (sea surface temperature)
SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:
	1. bias	$\geq 4 \text{ hPa}$ (pressure), $\geq 5 \text{ m s}^{-1}$ (wind speed), $\geq 30 \text{ degrees}$ (direction). $\geq 3 \text{ degrees}$ (sea surface temperature).
	2.SD	$\geq 6 \text{ hPa}$ (pressure), $\geq 80 \text{ degrees}$ (direction). $\geq 5 \text{ degrees}$ (sea surface temperature).
	3.PGE	≥ 25 .

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed $> 5 \text{ m s}^{-1}$

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
25572	87.1	-45.1	P	233	27	100	6.8	-4.7	8.3
25573	80.9	136.9	P	23	70	87	5.9	-1.5	6.1
33577	-35.6	-27.4	P	142	100	100			
41921	24.8	-73.1	P	234	1	100	3.2	6.4	7.1
41945	33.2	-117.3	P	133	94	97	3.2	-1.7	3.6

48619	79.2	-159.5	P	143	100	100			
53524	-10.4	85.3	P	562	93	98	2.9	6.2	6.8

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41921	24.8	-73.1	SPEED	224	2	100	3.1	-5.2	6.0
41922	21.6	-71.4	SPEED	208	49	100	11.6	0.0	11.6
41925	23.4	-72.5	SPEED	217	1	100	3.1	-5.4	6.3

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
56506	-15.4	120.1	DIRN.	57	0	0	74.1	*****	150.6

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
21901	38.1	131.9	SST	288	0	66	0.9	-3.0	3.2
22584	22.3	120.0	SST	222	31	68	1.7	-1.0	2.0
22906	15.2	108.9	SST	20	0	90	1.0	-3.7	3.8
32693	17.9	-163.6	SST	732	0	100	0.2	3.1	3.1
46779	55.8	-155.6	SST	171	0	100	1.9	-3.5	4.0
46972	17.7	150.8	SST	173	0	100	0.3	4.3	4.3
53524	-11.5	88.6	SST	30	47	63	2.8	-2.2	3.6

Figure 2. DRIFTER mean daily count. DECEMBER 2004
All hours
Global average number of observations in 24 hours = 11093

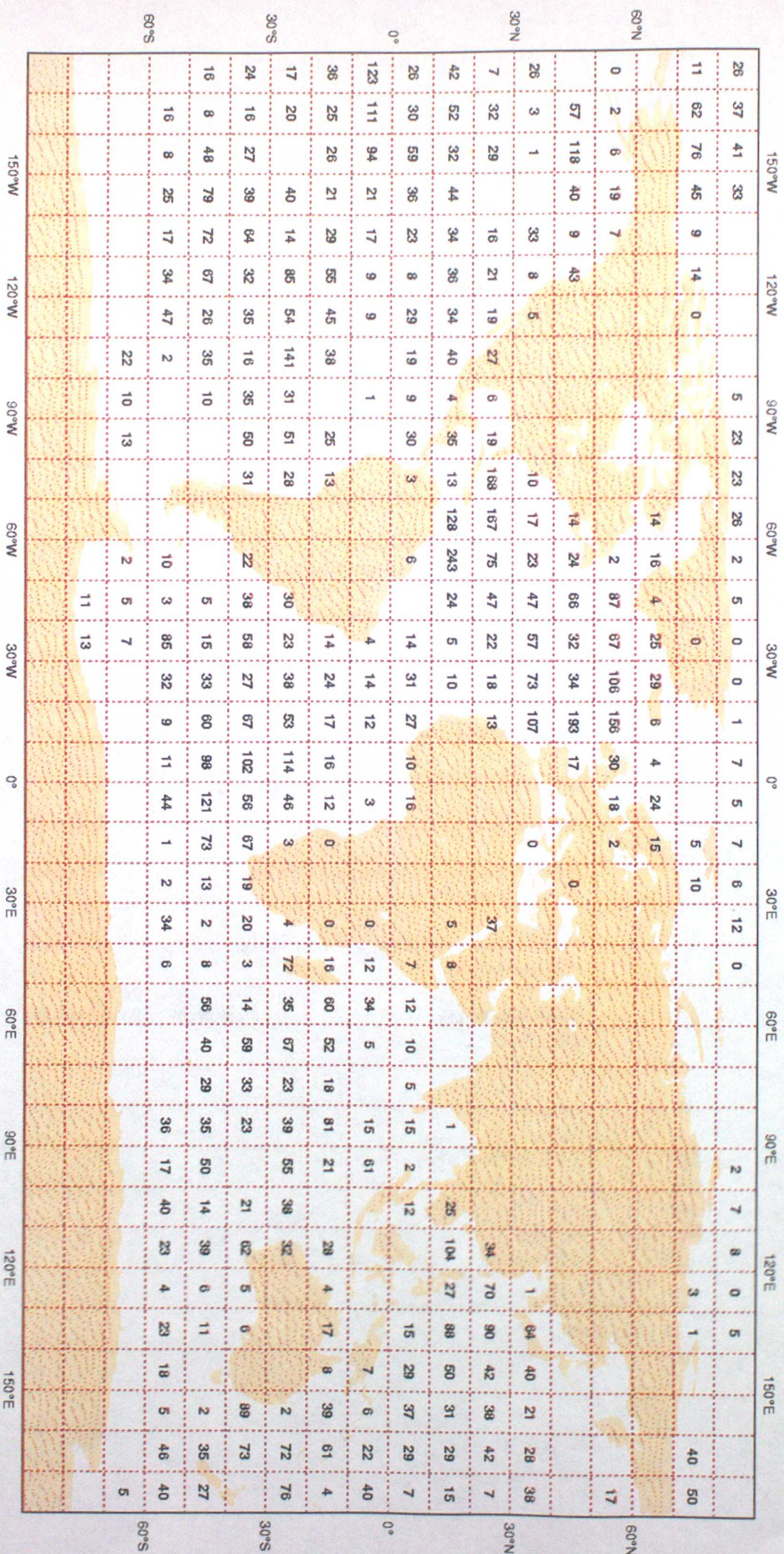


TABLE 3

**MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: EXETER
MONTH: Dec 2004**

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	≥ 20 ,and one or more of the following:
	1. bias	≥ 4 hPa
	2. SD	≥ 6 hPa
	3. PGE	≥ 25.

N.B. For stn ht ≥ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60320	35.9N	5.4W	2	MS	59	0	0	0	1.2	-10.1	10.2
61492	16.1N	13.5W	18	MS	50	0	0	0	1.5	4.1	4.4
62056	32.8N	21.9E	625	S8	45	2	4	0	1.1	-5.6	5.7
62271	24.2N	23.3E	417	M	39	0	0	0	1.0	4.2	4.3
63801	4.9S	29.6E	882	S8	42	0	0	0	1.0	8.4	8.5
63881	8.0S	31.6E	1923	S	33	4	12	0	1.2	13.0	13.1
65355	9.8N	1.1E	342	MS	99	0	0	0	0.6	-13.1	13.1
68014	19.6S	18.1E	1411	S8	84	1	1	1	1.4	-6.8	6.9
68030	18.5S	25.6E	1071	8	81	3	4	0	4.5	7.5	8.7
68102	19.9S	16.4E	1343	S8	56	0	0	0	0.8	6.0	6.1
68291	24.3S	31.1E	524	S8	116	0	0	42	5.7	4.2	7.1
68312	26.5S	18.1E	1067	S8	88	0	0	0	0.7	4.5	4.6
68325	25.4S	25.4E	1275	8	74	0	0	1	1.6	4.2	4.5
68396	26.5S	31.3E	641	S8	57	0	0	0	0.8	5.0	5.1
68575	30.0S	30.0E	1175	S8	117	117	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24329	66.3N	114.3E	236	MS	109	2	2	10	2.3	4.0	4.6
30554	54.5N	113.6E	995	MS	120	0	0	0	0.7	12.3	12.3
31123	57.8N	130.9E	255	MS	118	0	0	34	2.2	5.0	5.5
35416	49.1N	54.7E	128	S	115	0	0	0	0.6	4.4	4.4
36982	41.9N	78.2E	3635	S7	118	2	2	2	1.4	5.3	5.5
38565	40.6N	65.7E	485	MS	119	119	100	0			
38846	38.4N	70.0E	1437	S8	37	0	0	3	1.6	-6.3	6.5
40435	27.0N	44.1E	991	MS	58	0	0	3	1.9	6.8	7.1
40700	39.6N	47.9E	45	MS	117	0	0	0	0.9	-6.3	6.4
40713	37.4N	46.3E	1475	MS	116	57	49	0	0.7	13.5	13.5
40726	36.8N	45.7E	1384	MS	108	1	1	3	1.3	4.2	4.4
40741	36.5N	61.2E	235	MS	119	0	0	0	1.0	-5.0	5.1
40743	36.2N	57.7E	978	MS	118	0	0	1	1.0	5.1	5.2
40757	35.6N	53.4E	1171	MS	117	1	1	1	1.3	5.4	5.6
40780	33.6N	46.4E	1362	MS	118	0	0	0	0.6	4.5	4.5
40854	29.1N	58.4E	1067	MS	107	3	3	47	2.0	10.7	10.9
41254	23.1N	57.6E	1755	S8	117	117	100	0			
44243	49.8N	107.7E	883	MS	20	19	95	100	0.0	13.6	13.6
44254	48.9N	111.5E	986	MS	21	0	0	52	3.6	4.9	6.1
44257	48.6N	110.6E	747	MS	21	21	100	5			
44286	47.0N	103.8E	1250	MS	21	0	0	95	4.1	-10.5	11.3
44325	45.1N	97.8E	1056	MS	20	0	0	75	3.4	6.6	7.4
44329	44.6N	98.7E	2103	MS	21	0	0	100	0.8	-12.8	12.8
44338	44.6N	102.2E	1646	MS	21	4	19	100	0.7	13.5	13.5
44374	42.9N	100.2E	1494	MS	20	20	100	35			
44385	43.2N	107.2E	914	MS	20	20	100	100			
44416	28.6N	81.6E	720	MS	41	1	2	0	1.4	4.4	4.6
47022	40.8N	128.2E	1224	S	110	1	1	0	0.9	4.7	4.8
47678	33.1N	139.8E	79	MS	120	0	0	0	0.7	-8.9	8.9
48924	21.1N	101.5E	644	S	49	0	0	0	0.9	11.3	11.3
48925	20.7N	102.0E	550	S	51	1	2	0	0.8	-10.0	10.0
48938	19.2N	101.7E	326	MS	47	41	87	0	0.4	14.3	14.3
48952	15.7N	106.4E	168	MS	40	1	3	3	0.9	-4.1	4.2
50727	47.2N	119.9E	1028	MS	119	0	0	0	0.8	4.9	5.0

50978	45.3N	130.9E	234	MS	120	0	0	0	0.7	-5.9	5.9
51243	45.6N	84.9E	428	MS	120	0	0	10	1.5	-4.4	4.6
51288	45.4N	90.5E	1651	S	120	0	0	28	1.4	-5.3	5.5
51334	44.6N	82.9E	321	M	114	0	0	24	3.3	4.7	5.7
51379	44.0N	89.6E	794	M	111	0	0	23	2.4	6.3	6.7
51818	37.6N	78.3E	1376	M	115	0	0	65	2.7	6.0	6.6
52378	41.4N	102.4E	960	M	115	0	0	35	2.6	4.2	4.9
52866	36.6N	101.8E	2262	S	120	0	0	0	1.2	-4.6	4.8
53083	44.6N	114.2E	1183	M	115	1	1	25	2.9	7.1	7.7
53352	41.7N	110.4E	1377	M	117	1	1	17	3.2	6.5	7.2
53480	41.0N	113.1E	1416	M	114	0	0	51	2.9	5.6	6.3
53487	40.1N	113.3E	1069	M	115	0	0	21	2.5	4.1	4.8
53502	39.8N	105.8E	1143	M	115	0	0	50	2.1	4.4	4.9
53646	38.3N	109.8E	1058	MS	120	0	0	0	0.7	-13.1	13.1
53673	38.8N	112.7E	838	M	114	0	0	2	2.6	4.0	4.8
53863	37.0N	111.9E	750	M	117	0	0	5	1.9	4.2	4.6
54115	43.6N	118.1E	800	M	115	0	0	17	2.5	4.1	4.8
54311	41.9N	117.8E	844	M	115	0	0	3	2.6	4.0	4.8
54386	41.4N	128.2E	1018	M	115	0	0	77	2.9	6.2	6.8
56193	32.4N	104.5E	877	M	120	0	0	1	2.5	4.6	5.2
56287	30.0N	103.0E	629	M	120	0	0	7	1.8	5.1	5.4
56385	29.5N	103.3E	3049	S	120	0	0	58	2.5	-4.6	5.2
56462	29.0N	101.5E	2994	S	120	0	0	0	1.7	9.2	9.4
56768	25.0N	101.5E	1773	S	120	0	0	0	0.8	-5.6	5.7
57014	34.6N	105.9E	1086	M	113	0	0	0	2.5	5.2	5.8
57816	26.6N	106.7E	1074	MS	120	117	98	0	0.3	-14.6	14.6
59663	21.8N	112.0E	22	MS	120	0	0	0	0.9	-7.6	7.7

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	122	MS	31	0	0	23	1.0	-6.0	6.1
80342	1.4N	77.3W	1802	S	48	33	69	0	0.4	-14.0	14.0
80434	9.2N	66.0W	125	MS	36	1	3	3	1.7	-5.0	5.3
82181	2.0S	54.1W	146	MS	86	0	0	0	1.1	6.2	6.3
82704	7.6S	72.7W	170	MS	76	1	1	3	2.4	-4.4	5.0
83235	12.4S	46.4W	604	MS	90	0	0	0	0.9	6.1	6.2
83332	14.1S	46.4W	826	MS	90	19	21	1	0.7	13.8	13.8
83470	17.9S	50.9W	727	MS	90	0	0	0	0.7	-5.7	5.7
83531	18.6S	46.5W	940	MS	88	0	0	1	1.0	-6.1	6.2
83836	25.5S	50.6W	837	MS	91	0	0	0	0.7	-4.4	4.5
83970	31.3S	50.9W	4	M	66	0	0	83	2.6	-5.0	5.6
84425	5.9S	76.1W	179	S	20	0	0	0	1.1	4.6	4.7
84452	6.8S	79.8W	29	MS	86	0	0	0	0.7	4.3	4.4
84455	6.5S	76.4W	281	MS	64	1	2	2	1.4	7.0	7.1
84472	7.1S	78.5W	2620	S	42	0	0	0	0.8	-5.2	5.3
84474	7.2S	76.7W	350	S	21	0	0	0	1.0	8.7	8.8
84688	13.7S	73.4W	3444	S	40	0	0	0	0.5	-11.9	11.9
84782	18.1S	70.3W	468	MS	69	0	0	0	1.2	4.4	4.6
85140	14.3S	67.4W	140	MS	44	0	0	0	1.2	7.3	7.4
85264	18.5S	64.1W	1998	S	44	44	100	20			
85312	19.8S	63.9W	992	S	31	1	3	0	1.0	-10.6	10.6
85406	18.3S	70.3W	55	M	118	0	0	0	0.9	4.1	4.2
85432	22.5S	68.9W	2320	S8	86	0	0	0	0.5	4.7	4.7

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
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71021	61.3N	124.5W	283	MS	119	0	0	39	1.9	4.7	5.1
71060	52.5N	116.1W	230	MS	119	119	100	0			
71094	66.6N	61.6W	393	MS	119	0	0	18	1.6	-4.8	5.1
71177	57.1N	61.5W	834	S	117	0	0	15	2.4	-4.2	4.8
71179	54.7N	58.4W	683	S	118	0	0	33	2.3	-4.0	4.6
71181	47.1N	55.3W	29	MS	120	0	0	0	0.8	-6.2	6.3
71506	67.0N	136.2W	720	MS	119	1	1	8	2.5	-6.0	6.5
71581	54.5N	128.6W	215	MS	120	78	65	0	6.0	-4.8	7.7
72327	36.1N	86.7W	182	MS	118	0	0	0	0.7	4.1	4.2
76055	31.0N	114.9W	440	MS	22	22	100	0			
76225	28.6N	106.1W	1435	MS	47	0	0	0	0.9	-4.2	4.3
76543	22.0N	98.8W	104	MS	66	1	2	2	2.6	9.2	9.6
76658	19.2N	103.7W	494	MS	24	0	0	0	0.6	5.6	5.6
76762	17.5N	99.5W	1265	MS	39	0	0	0	0.5	5.7	5.7
76773	17.8N	97.8W	1650	MS	21	0	0	5	1.2	6.4	6.5
76843	16.8N	93.1W	528	MS	80	0	0	1	2.3	-4.4	5.0
78588	17.2N	87.5W	-9999	M	116	116	100	0			
78655	14.0N	89.6W	660	MS	69	0	0	33	1.1	4.0	4.1

WMO REGION 5:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
94130	14.8S	131.9E	120	MS	120	0	0	0	1.0	5.0	5.1
96505	3.7N	115.7E	-9999	8	28	27	96	0	0.0	0.9	0.9
97378	10.7S	123.1E	1	MS	43	40	93	0	8.2	-3.2	8.8

WMO REGION 6:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	711	MS	115	0	0	0	1.1	6.0	6.1
06239	54.9N	44.7E	49	MS	350	132	38	0	9.1	-0.2	9.1
06605	47.1N	7.1E	1599	S8	119	0	0	9	1.4	-5.4	5.6
06685	47.0N	9.1E	515	MS	119	0	0	4	1.4	7.7	7.8
08912	42.9N	0.8W	1434	MS	20	20	100	0			
08922	42.8N	0.2W	1660	MS	20	20	100	0			
10850	48.8N	10.7E	457	MS	360	0	0	0	0.5	-6.1	6.1
11116	47.5N	10.8E	870	MS	59	0	0	2	1.5	4.8	5.0
12510	50.7N	15.7E	1603	S8	120	0	0	43	1.8	-4.2	4.6
13269	44.3N	19.9E	176	MS	109	0	0	0	0.9	8.2	8.2
13289	44.1N	21.9E	1037	8	111	0	0	67	2.5	-4.2	4.9
14554	44.9N	18.4E	136	S	59	5	8	2	0.7	-13.2	13.2
16538	40.1N	9.3E	1022	S	28	3	11	11	1.3	9.7	9.8
17088	40.5N	39.5E	1219	S8	116	0	0	7	1.7	4.1	4.4
17203	38.9N	40.5E	1177	S8	112	0	0	1	1.3	4.9	5.1
17521	35.2N	33.5E	285	MS	99	99	100	0			

ANTARCTIC:

STATION	LAT	LONG	HT (M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89257	75.4S	59.9W	40	S	646	0	0	0	1.4	-5.8	6.0
89263	66.0S	66.1W	20	M	257	0	0	0	1.0	12.5	12.5
89266	72.2S	60.2W	91	S	255	255	100	0			
89272	75.0S	70.8W	1395	S	256	256	100	0			
89610	65.9S	113.1E	90	S	242	0	0	0	1.1	-9.1	9.2
89614	66.7S	111.5E	500	S	255	255	100	0			
89744	74.0S	43.1E	3353	S	252	0	0	0	0.6	6.4	6.4

89811 66.7S 112.8E 1366 S 235 0 0 0 1.2 -5.1 5.2

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures

Period	:One calendar month.
Data monitored	:Statistics for each airline carrier.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from UKMO global model.
Observation times	:All hours combined.
Level(s) monitored	:300.0 - 150.0 hPa
Elements monitored	:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	
:N REP.	:Number of observations received excluding duplicates.
:PG	:Percentage of observations with gross errors.
:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
:PC	:Percentage of observations with calm winds.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind
SELECTION CRITERIA	:N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
AAH	4165	0	42	1.5	0.1	4089	0	42	0	6.8	0.9
AAL	6680	0	37	1.5	0.1	6273	0	38	0	7.0	0.7
AAR	1032	0	5	1.7	-0.5	1024	0	6	0	7.3	-0.2
ACA	2420	1	12	1.6	0.1	1955	0	14	0	7.7	-0.1
ACI	129	2	12	1.0	0.2	129	0	11	0	6.0	0.1
AEA	1641	0	3	1.5	-0.1	1332	1	5	0	9.2	-0.4
AFL	801	0	3	1.6	0.3	433	1	4	0	6.9	0.3
AFR	1512	0	6	1.4	0.3	1465	0	8	0	8.6	0.1
AJM	389	0	1	1.3	-0.1	338	0	4	0	8.8	-0.2
AJX	353	1	5	1.6	0.7	351	1	8	0	9.5	0.0
AMD	164	0	61	1.7	0.9	164	0	60	0	4.6	0.2
AMT	1849	1	42	1.3	0.0	1807	0	43	0	7.5	0.7
AMX	562	1	5	1.7	0.2	537	0	10	0	13.1	-1.5
ANA	55	0	4	1.4	0.1	55	0	2	0	5.1	-0.2
ANZ	6114	0	25	1.3	0.2	6096	0	25	0	6.2	0.2
ARG	38	3	45	2.2	-0.2	36	0	44	0	9.3	0.2
ATN	124	0	100	3.5	-1.6	111	0	56	0	11.9	4.2
AUA	88	0	20	3.1	1.8	87	3	9	0	7.8	-0.6
AVA	344	1	4	1.8	0.6	342	1	100	0	9.7	0.2
AVN	234	0	44	1.2	0.0	231	0	43	0	5.1	0.1
AXF	48	0	38	1.2	0.2	48	0	38	0	8.4	-0.3
AZA	852	1	8	2.2	0.5	715	0	7	0	9.0	0.3
BAL	517	0	7	1.5	0.0	506	1	8	0	7.4	0.3
BAW	660	1	17	1.7	-0.5	424	0	18	0	8.2	0.1
BBR	336	1	3	1.5	0.5	336	0	100	0	14.1	1.7
BHP	72	0	3	1.5	-0.5	65	0	5	0	10.2	-1.5
BPA	551	0	100	2.7	1.4	540	1	11	0	9.1	-0.7
BSK	38	0	29	1.4	-0.3	35	0	34	0	10.5	2.5
BWA	446	0	4	1.6	0.0	380	1	7	0	9.1	0.0
CAL	54	4	7	1.2	0.0	52	0	12	0	10.5	1.3
CCA	333	2	15	2.6	0.0	325	1	100	0	13.5	-0.6
CES	395	2	6	1.8	0.1	396	1	5	0	8.4	0.2
CFC	64	0	8	1.4	0.2	61	0	11	0	10.1	0.6
CFG	1153	0	3	1.4	0.2	1082	0	5	0	8.7	-0.1
CKK	83	2	10	1.5	0.6	96	0	6	0	5.7	1.1
CKS	745	0	38	1.8	0.0	697	0	41	0	9.2	-0.3
CLX	442	0	3	1.5	-0.5	275	0	4	0	8.0	0.1
COA	217	0	40	1.2	0.0	176	1	44	0	10.3	-0.8
CRL	968	1	3	1.5	0.7	935	0	35	0	9.1	0.2
CSD	51	2	4	2.2	0.5	37	0	8	0	10.2	1.2
CSN	101	0	9	2.0	-0.2	101	1	9	0	9.0	0.1
CUB	270	1	7	2.1	0.1	254	0	8	0	10.5	0.2
DAL	3746	0	38	1.5	0.1	3397	0	41	0	6.7	0.4
DCS	29	0	7	2.1	0.2	20	0	10	0	8.0	2.6
DHL	153	1	100	6.2	-5.9	88	0	30	0	15.1	0.5
DLH	926	1	11	1.5	-0.1	857	0	11	0	6.8	0.4
DRD	304	2	3	1.5	0.0	301	1	100	0	8.8	0.1
EDW	95	0	2	1.6	0.1	86	0	35	0	7.6	0.0
EEZ	152	2	7	1.5	0.3	150	0	8	0	8.7	1.3
EIA	240	0	11	1.4	0.4	223	1	100	0	20.8	3.8
ELY	69	0	1	1.2	0.0	59	0	2	0	6.2	-0.1
ETH	28	0	0	1.3	0.3	25	0	0	0	4.7	0.1
EVA	160	0	8	1.5	-0.2	178	1	11	0	9.0	-1.0
FCA	157	3	6	1.4	0.2	139	1	7	0	10.4	-0.3
FDX	1926	0	49	1.4	0.2	1766	0	50	0	7.4	0.5
FIN	273	1	5	1.6	0.1	204	0	5	0	7.9	0.1
FJI	831	1	32	2.1	1.1	818	0	28	0	6.1	0.2

FOM	1000	0	25	1.4	0.2	991	0	25	0	6.6	0.1
FWI	666	2	6	1.7	-0.2	654	1	7	0	9.5	-0.1

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	PG	WIND			BIAS
		PG	PR	RMS	PR				PC	RMS		
GCO	181	2	17	1.4	0.3	176	1	21	0	10.7	1.1	
GRL	71	1	1	1.6	0.5	53	0	0	0	4.3	0.8	
GTI	253	1	27	2.4	1.1	253	0	26	0	9.1	-0.3	
HAL	4835	0	39	1.7	0.5	4751	0	39	0	7.1	0.7	
HMY	33	0	42	1.3	0.2	31	0	42	0	6.7	0.6	
HXL	484	0	3	1.4	-0.1	431	0	4	0	9.7	-0.6	
IBE	3958	1	5	1.6	0.3	3909	0	7	0	9.6	-0.7	
ICE	895	0	4	1.6	-0.1	549	0	4	0	7.5	0.5	
IWD	301	0	2	1.7	0.2	296	0	3	0	7.8	-0.1	
JAL	2523	0	4	1.7	0.3	2494	0	4	0	7.5	0.2	
JAZ	1120	1	5	1.3	0.6	1119	1	6	0	7.3	0.1	
JBU	64	0	0	0.7	0.1	67	0	0	0	4.0	0.1	
KAI	48	0	40	2.5	1.9	49	0	39	0	8.2	2.1	
KAL	1533	1	10	1.9	0.1	1521	0	10	0	7.4	-0.1	
KLM	1320	0	4	1.4	0.0	1007	0	7	0	8.5	0.1	
LAN	643	0	3	1.5	0.2	644	0	4	0	5.7	0.4	
LAP	32	0	44	2.4	1.6	29	0	41	0	6.8	-1.3	
LDI	456	1	5	1.8	0.2	383	1	6	0	8.8	-0.4	
LNE	117	5	9	1.8	0.1	113	1	4	0	9.7	0.1	
LOT	321	0	4	2.0	0.2	202	0	2	0	5.7	0.0	
LTU	1262	1	6	1.5	0.0	1012	1	6	0	8.5	0.1	
LXR	49	0	6	2.2	0.5	45	0	11	0	10.7	-1.2	
MAS	210	0	7	2.2	0.6	207	0	7	0	9.2	0.2	
MON	47	0	4	1.4	-0.3	43	0	2	0	9.4	1.9	
MPD	497	0	2	1.8	0.7	480	0	3	0	8.4	-0.2	
MPH	661	1	3	1.5	-0.6	538	0	4	0	8.5	-0.3	
MXA	49	2	24	3.5	1.1	49	6	100	0	17.8	-1.3	
MYT	246	1	4	1.6	0.0	187	1	3	0	6.5	0.1	
NAO	474	1	41	1.8	0.6	471	0	41	0	7.8	1.1	
NCA	1088	0	3	1.5	0.1	806	0	5	0	8.0	0.1	
NOS	42	0	2	0.9	-0.4	35	0	6	0	8.6	-0.5	
NVR	61	2	2	1.3	-0.1	44	0	2	0	9.3	0.3	
NWA	7698	1	17	1.7	0.1	7570	0	18	0	8.5	0.2	
NZL	3051	0	9	1.1	0.1	3050	0	9	0	5.4	0.2	
OAE	609	0	26	1.2	-0.3	523	0	42	0	13.2	2.6	
OOM	73	0	4	1.8	-1.2	53	0	4	0	7.9	-0.5	
PAC	374	0	9	1.5	-0.1	358	1	11	0	9.2	-1.0	
PAL	1621	0	10	1.5	0.0	1566	0	13	0	9.0	0.0	
PAO	326	0	48	1.1	0.3	325	0	48	0	5.6	0.0	
PBI	729	1	34	1.5	0.0	721	0	33	0	7.5	-0.1	
PLM	251	0	4	2.2	1.7	217	0	42	0	10.3	-0.5	
PUA	22	9	55	2.2	0.8	22	0	59	0	14.3	6.6	
QFA	4051	0	43	1.2	0.3	4022	0	43	0	6.2	-0.1	
QQA	33	0	48	0.8	-0.2	33	0	48	0	3.5	-0.9	
RAM	350	0	2	1.6	0.1	282	1	46	0	12.1	-1.3	
RCH	296	4	100	3.7	-0.7	233	1	100	0	14.4	-1.1	
RZO	614	0	6	1.7	-0.4	595	1	43	0	11.4	-0.7	
SAA	60	0	0	1.3	0.2	58	0	2	0	9.1	-0.3	
SEU	171	0	3	1.7	0.3	163	1	2	0	6.2	0.4	
SIA	435	0	3	1.3	0.5	435	0	3	0	4.9	0.4	
SKI	24	0	50	2.6	1.1	29	0	66	0	20.4	0.6	
SLM	154	0	2	1.4	0.4	153	0	45	0	7.4	0.0	
SQC	47	0	2	1.7	0.9	47	0	2	0	6.8	1.3	
SVH	279	0	7	1.3	1.0	279	0	7	0	5.6	0.7	
TAG	31	0	19	3.0	0.9	33	0	24	0	11.7	-1.0	
TAM	27	0	41	2.2	1.3	27	0	41	0	8.5	1.6	
TAP	624	1	3	1.3	-0.3	561	0	40	0	9.8	-0.1	

TCX	28	0	4	1.1	0.7	29	0	3	0	3.9	0.4
THA	269	0	4	1.5	0.1	269	0	3	0	6.2	0.5

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
THT	975	0	22	1.2	0.6	968	0	22	0	6.0	0.8	
TPA	34	0	3	1.3	0.4	30	0	7	0	8.1	-0.9	
TSC	50	2	2	1.1	-0.5	36	3	8	0	13.9	-2.6	
TSO	25	0	0	1.7	-1.1	26	0	0	0	6.2	1.4	
TUB	168	0	8	1.9	1.2	169	0	8	0	5.3	1.3	
UAE	563	0	11	1.5	0.5	563	0	11	0	5.3	0.7	
UAL	263840	0	96	1.3	-0.2	263783	0	96	0	5.0	0.5	
UPS	1759	1	61	1.8	0.5	1734	0	61	0	7.0	0.4	
USA	229	2	5	1.6	0.4	190	0	5	0	8.0	1.0	
UVG	21	0	0	1.4	0.8	20	0	5	0	9.2	-2.7	
VHF	40	0	0	0.7	0.1	40	0	0	0	6.7	1.4	
VIR	163	1	4	1.4	-0.2	106	1	3	0	6.8	0.7	
VPB	29	0	21	3.7	2.0	24	0	13	0	14.3	-2.3	
VRG	39	8	46	2.4	0.7	39	0	100	0	13.1	0.9	
VVJ	54	0	28	1.8	-0.4	52	0	31	0	8.9	-0.3	
VVR	65	0	37	1.8	-0.2	63	0	37	0	6.8	0.5	
WOA	489	0	14	1.3	0.3	440	0	17	0	9.6	0.2	
XLA	155	1	2	0.9	-0.2	150	1	4	0	7.5	0.3	
YSS	41	0	2	1.7	-0.5	38	0	11	0	14.1	-3.1	

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
AU	41516	0	11	1.2	0.7	41544	0	10	0	5.2	0.4	
B-	10592	0	77	2.2	0.8	10592	0	76	0	5.1	0.2	
EU	203847	0	26	1.2	0.3	203845	0	26	0	4.5	0.4	
HK	4308	0	25	1.3	0.3	4308	0	25	0	5.0	0.4	
JP	28950	0	51	1.5	0.8	28950	0	50	0	4.8	0.4	
MK	3160	0	6	1.7	1.6	3127	0	6	0	6.4	1.7	
SA	4630	0	15	1.2	0.8	4630	0	39	0	5.0	0.0	
TN	64	3	27	1.7	1.0	67	0	30	0	8.9	0.6	

IDENT.	N.REP.	TEMPERATURE				BIAS	N.REP.	WIND				BIAS
		PG	PR	RMS	PG			PR	PC	RMS		
N	1252	2	30	2.2	0.6	1130	0	32	0	8.0	0.6	
US ACARS	1079833	0	66	1.4	0.3	1079825	0	66	0	5.2	0.5	

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures

Period	:One calendar month.
Data monitored	:Statistics for each airline carrier.
Area monitored	:90°N - 90°S, 180°W - 180°E.
Standard of comparison	:Background field from UKMO global model.
Observation times	:All hours combined.
Level(s) monitored	:1000.0 – 300.1 hPa
Elements monitored	:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	
:N REP.	:Number of observations received excluding duplicates.
:PG	:Percentage of observations with gross errors.
:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
:PC	:Percentage of observations with calm winds.
:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind
SELECTION CRITERIA	:N REP ≥ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
AAL	272	0	40	1.7	-0.1	255	0	41	0	5.8	0.5
ACA	97	0	13	1.5	0.2	89	0	12	0	5.8	0.0
ACI	21	0	33	0.9	0.4	21	0	33	0	4.8	-0.2
AFR	84	0	5	1.4	0.6	85	0	8	0	7.3	-1.0
AMD	314	0	70	1.3	0.5	314	0	70	0	4.5	0.5
AMT	46	2	22	1.1	-0.2	42	0	26	0	10.3	1.3
AMX	21	0	19	2.5	0.1	20	0	25	0	13.2	3.2
ANZ	233	1	19	1.4	0.1	238	0	19	0	5.9	0.7
AXF	33	3	61	0.9	0.1	33	0	58	0	7.1	-2.7
AZA	27	0	7	2.1	-0.1	23	0	4	0	8.0	-0.1
BAL	25	0	12	1.9	-0.4	24	0	8	0	5.3	-0.3
CFC	84	0	7	1.6	0.6	69	0	9	0	9.0	0.3
CFG	26	0	0	0.8	0.4	26	0	4	0	6.1	0.3
CKS	25	4	24	2.9	1.0	20	0	20	0	6.4	1.1
CRL	42	0	5	1.0	0.3	41	0	51	0	6.4	0.5
CWC	58	2	2	1.5	0.2	31	0	19	0	12.6	0.2
DAL	203	1	41	1.6	-0.3	180	1	46	0	8.3	0.2
DLH	340	1	10	1.4	-0.1	342	0	9	0	5.5	0.3
EIA	65	0	14	1.4	0.5	62	0	100	0	20.4	-2.4
FDX	651	0	32	1.4	0.3	512	1	31	0	7.3	0.2
FIN	97	1	3	1.5	-0.1	71	0	1	0	4.8	-0.4
GAF	47	0	6	1.6	0.3	25	0	8	0	7.7	0.8
GCO	84	0	6	1.0	0.2	85	0	7	0	8.6	0.7
HAL	595	1	42	1.7	0.2	580	0	41	0	7.8	1.1
IBE	60	0	13	1.5	0.3	60	0	12	0	6.7	-0.1
ICE	87	0	0	1.5	-0.9	50	0	0	0	5.3	0.5
JAL	103	0	4	1.4	0.2	103	0	4	0	6.5	0.3
JAZ	55	0	15	1.7	0.6	57	0	14	0	4.7	1.0
KAL	53	4	17	1.9	0.0	53	0	19	0	10.5	1.4
KIW	53	11	34	2.8	1.6	58	0	2	0	6.2	-0.7
KLM	56	0	7	1.7	0.0	42	0	10	0	5.9	0.7
LAN	53	4	11	0.9	-0.2	52	0	12	0	6.8	0.8
MAS	20	0	15	1.5	-0.2	20	0	20	0	10.6	0.8
MPH	95	0	2	1.2	0.0	70	0	4	0	8.6	0.2
NCA	92	0	1	1.5	0.1	79	0	3	0	6.6	-0.5
NWA	403	2	20	1.7	0.2	405	0	21	0	7.4	0.8
NZL	17065	0	54	1.3	0.0	17066	0	54	0	5.2	-0.1
OAE	48	0	8	1.5	0.0	32	0	25	0	15.5	3.2
OCE	52	0	19	1.7	0.7	45	0	24	0	12.7	0.1
PAC	50	0	4	1.4	-0.8	44	0	9	0	9.7	0.6
PAL	34	6	38	0.9	-0.4	34	0	35	0	6.9	0.8
QFA	297	0	35	1.1	0.1	295	1	36	0	5.2	-0.3
RCH	47	0	100	2.3	0.5	44	0	100	0	12.1	1.2
RRR	77	1	22	2.8	1.8	77	0	22	0	12.3	-0.7
SIA	69	0	4	1.0	0.4	72	0	6	0	4.2	0.8
SKI	244	2	45	3.0	1.2	324	0	45	0	16.2	0.3
SVH	13328	0	59	1.6	1.0	13328	0	59	0	4.1	0.4
THA	28	0	11	1.2	0.3	28	0	11	0	4.3	0.0
THT	28	0	61	1.1	-0.1	28	0	61	0	12.2	1.8
UAE	85	0	0	1.1	0.4	85	0	0	0	4.5	-0.5
UAL	206614	0	98	1.1	-0.2	206207	0	98	0	4.3	0.4
UPS	224	1	51	1.4	0.1	214	0	52	0	8.8	-0.1
WOA	152	1	11	1.7	0.1	129	0	18	0	9.5	1.5

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS

AU	34353	0	51	1.3	0.4	34357	0	51	0	4.4	-0.1
B-	48987	0	73	1.6	0.7	48987	0	73	0	4.1	0.3
EU	604804	0	69	1.1	0.2	601383	0	69	0	3.8	0.1
HK	4349	0	78	1.6	0.8	4349	0	78	0	4.8	-0.3
JP	61592	0	56	1.3	0.5	61592	0	56	0	4.6	0.3
MK	2643	0	47	1.5	0.8	2592	0	48	0	4.1	0.4
SA	4531	0	62	1.7	0.3	4531	0	75	0	5.1	0.4

IDENT.	N.REP.	TEMPERATURE			BIAS	N.REP.	PG	WIND			RMS	BIAS
		PG	PR	RMS				PR	PC			
US ACARS	1613370	0	79	1.2	0.3	1609394	0	80	0	4.3	0.3	

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. DECEMBER 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 55970

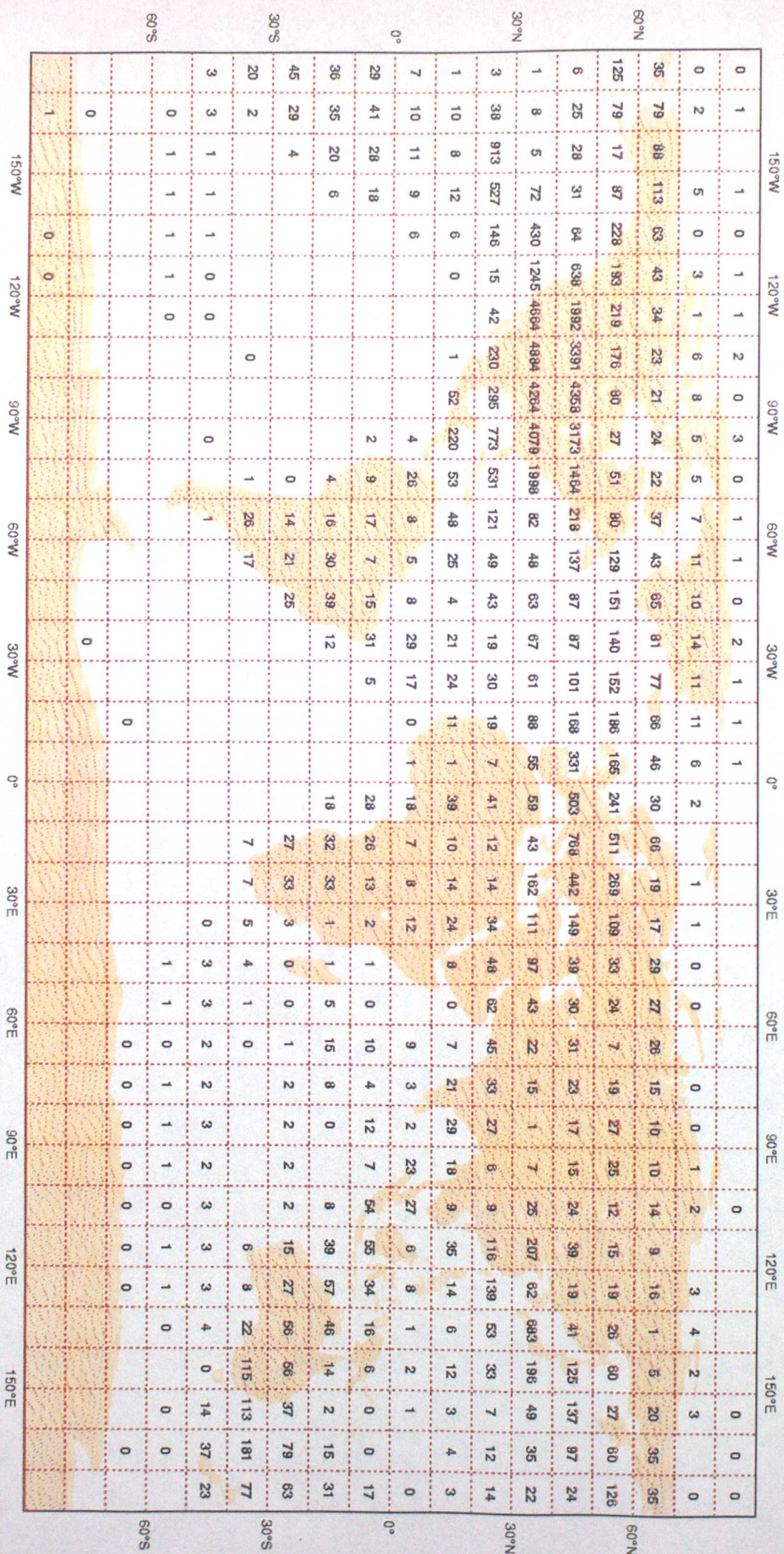


Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. DECEMBER 2004
Observations with O-B vector difference greater than 60 ms⁻¹ excluded
Global average number of observations in 24 hours = 84173

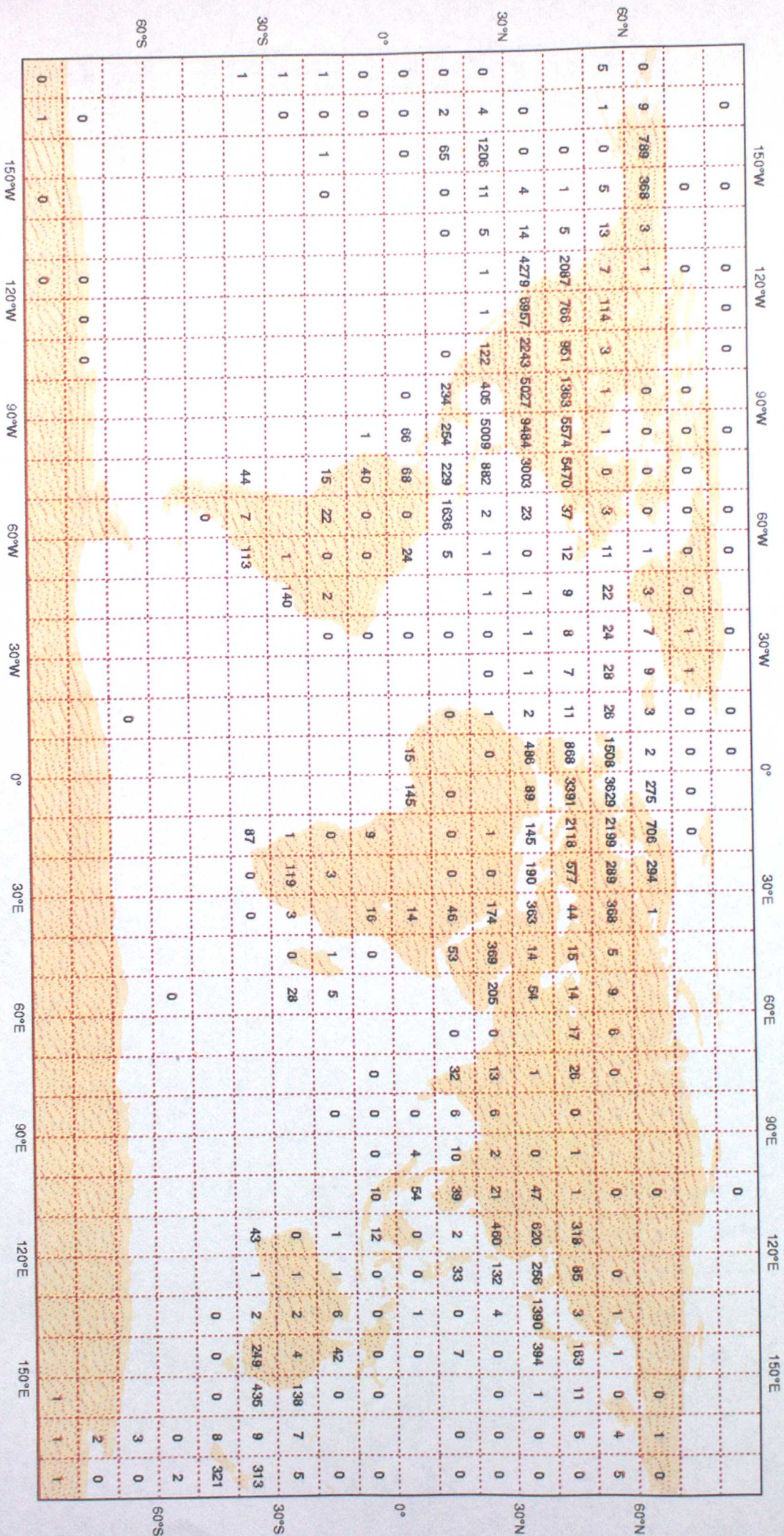
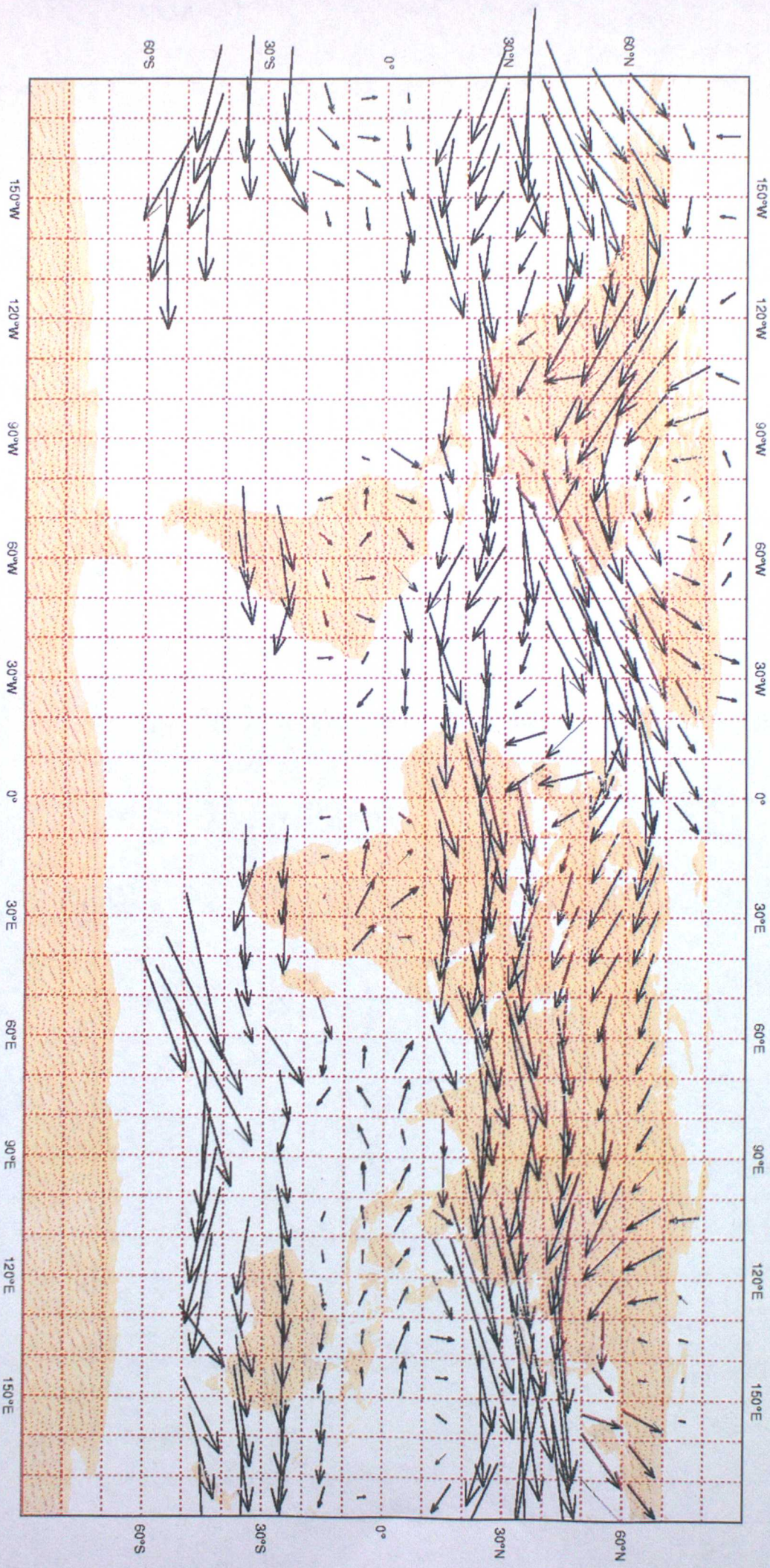


Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. DECEMBER 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Arrows are plotted where greater than 30 obs are present



15.0 m/s
 — X —
 →

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. DECEMBER 2004
Observations with O-B vector difference greater than 60 ms⁻¹ excluded
Arrows are plotted where greater than 30 obs are present

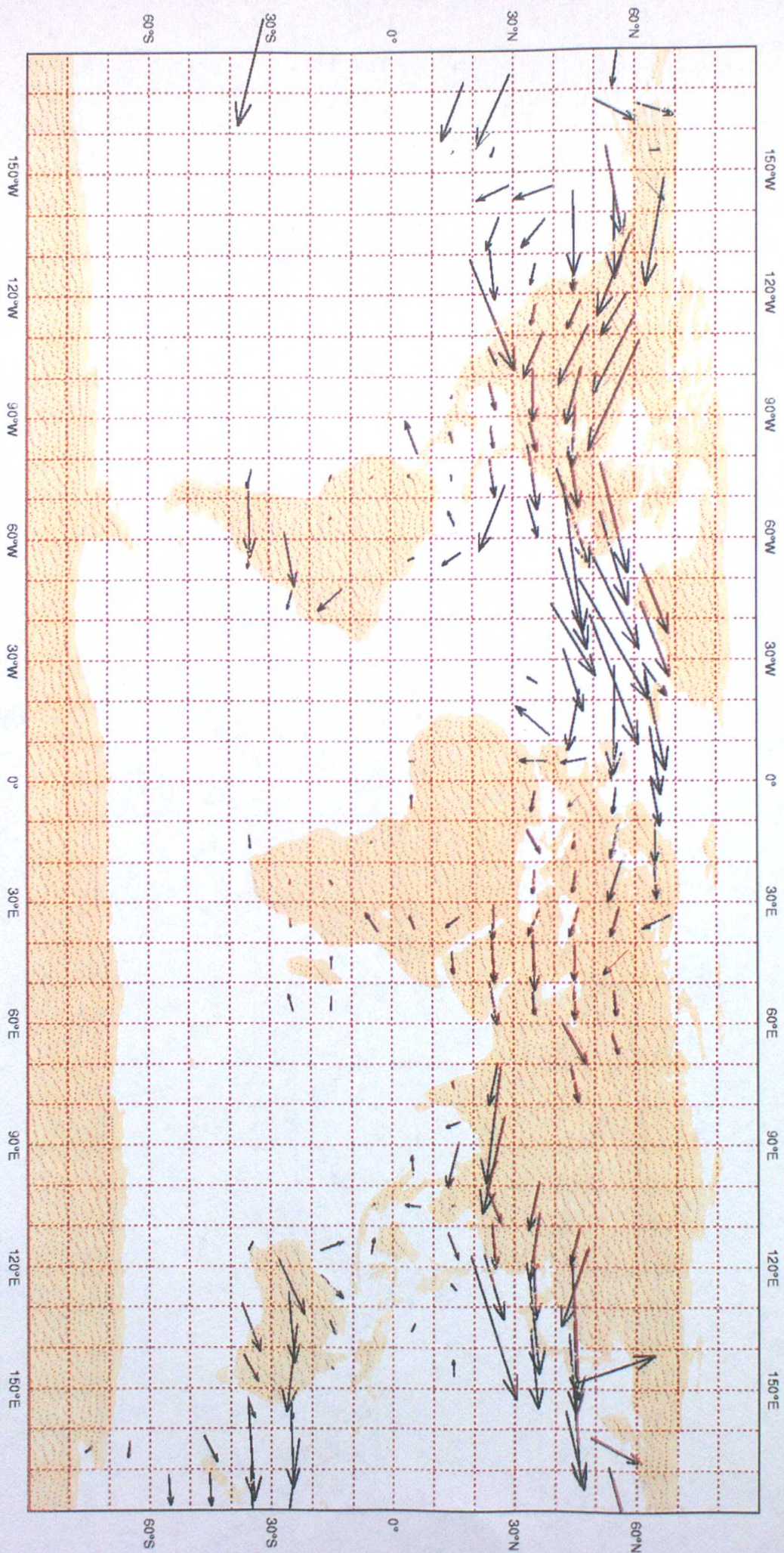


Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. DECEMBER 2004
Observations with O-B vector difference greater than 60 ms⁻¹ excluded
Arrows are plotted where greater than 30 obs are present

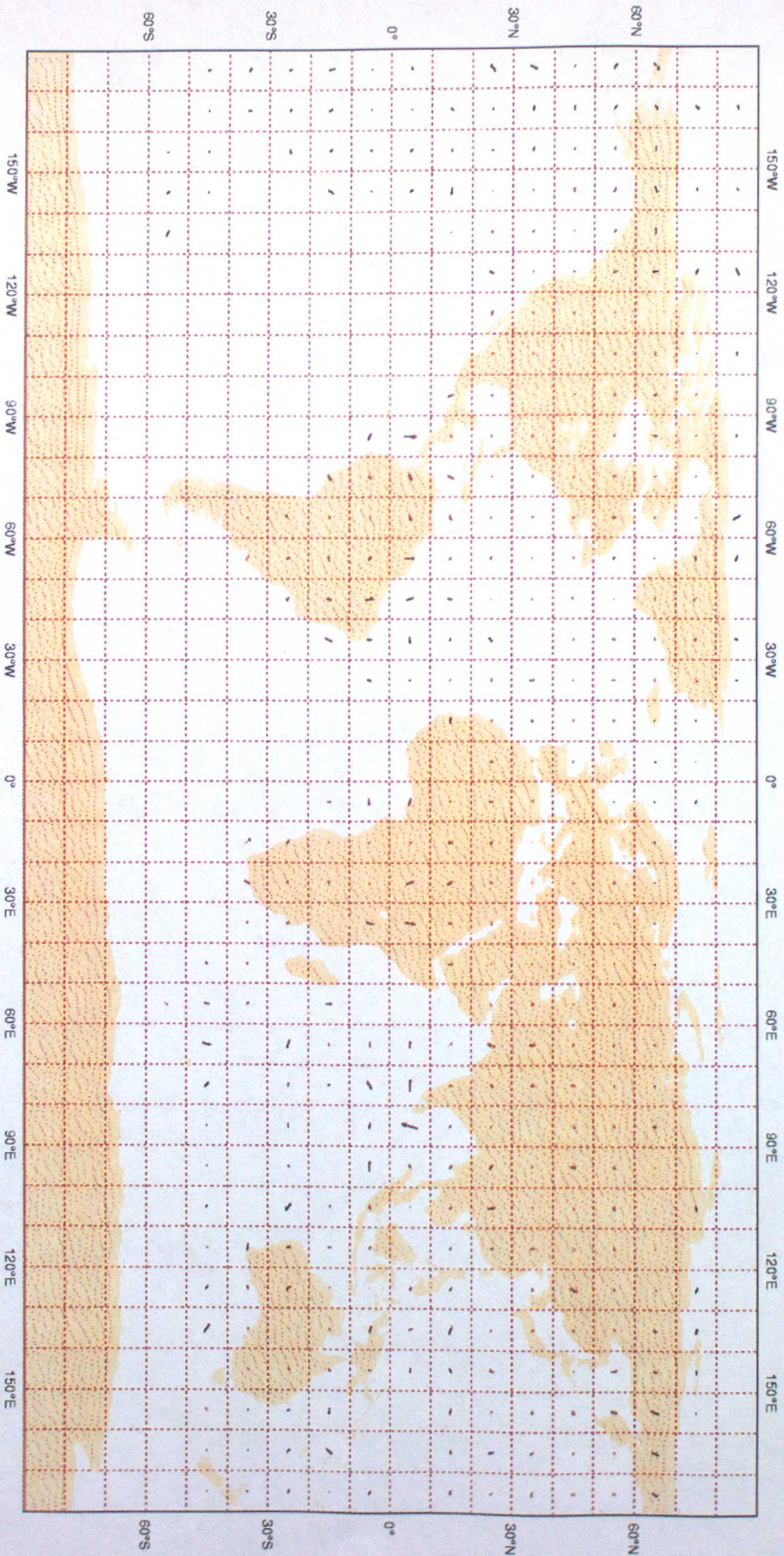
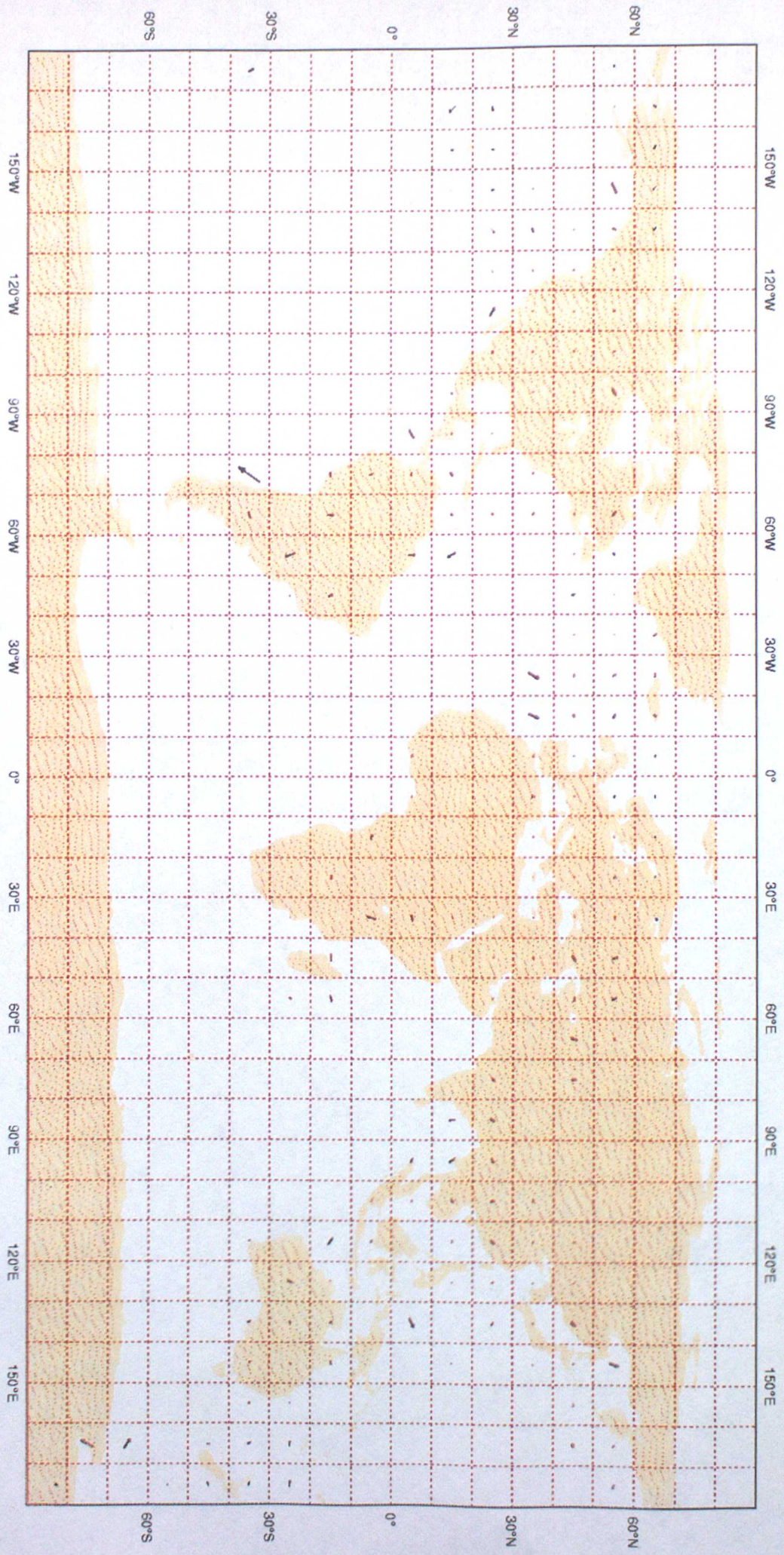


Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. DECEMBER 2004
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present



15.0 m/s
→

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms^{-1}). DECEMBER 2004
Observations with O-B vector difference greater than 60 ms^{-1} excluded
Values are printed where greater than 30 obs are present

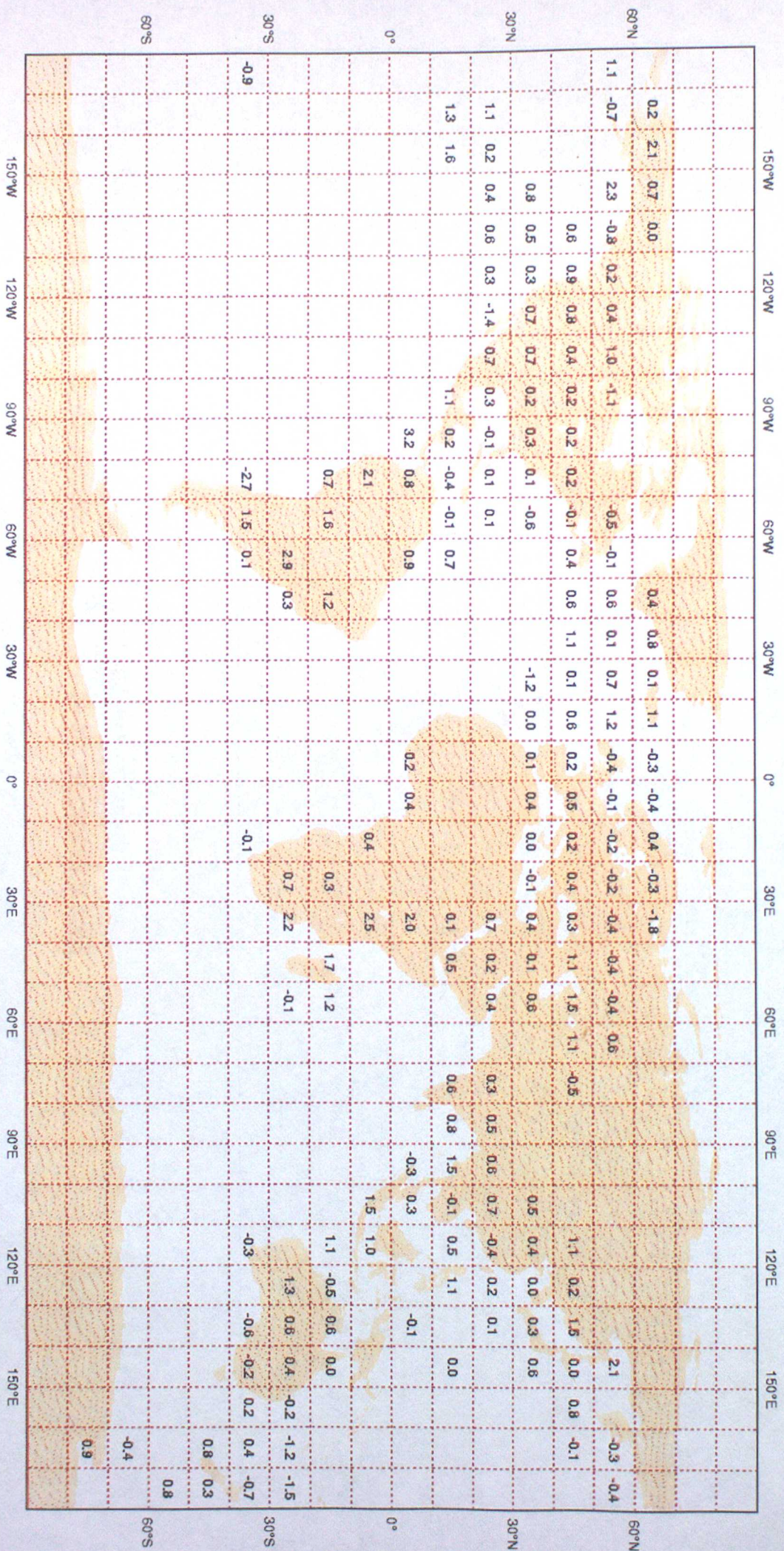


Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms⁻¹). DECEMBER 2004
Observations with O-B vector difference greater than 60 ms⁻¹ excluded
Values are printed where greater than 30 obs are present

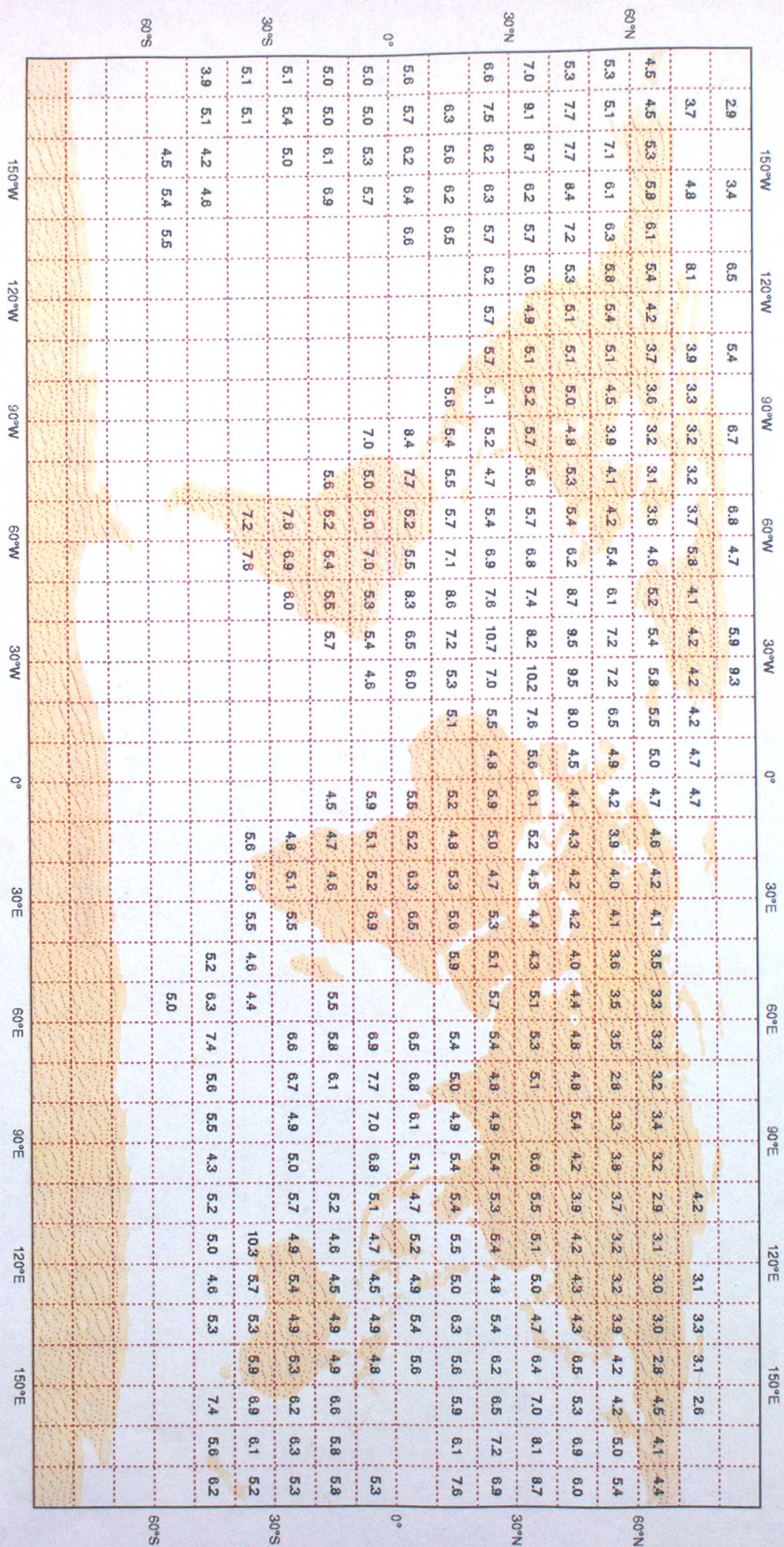


Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). DECEMBER 2004
 Observations with O-B vector difference greater than 60 ms-1 excluded
 Values are printed where greater than 30 obs are present

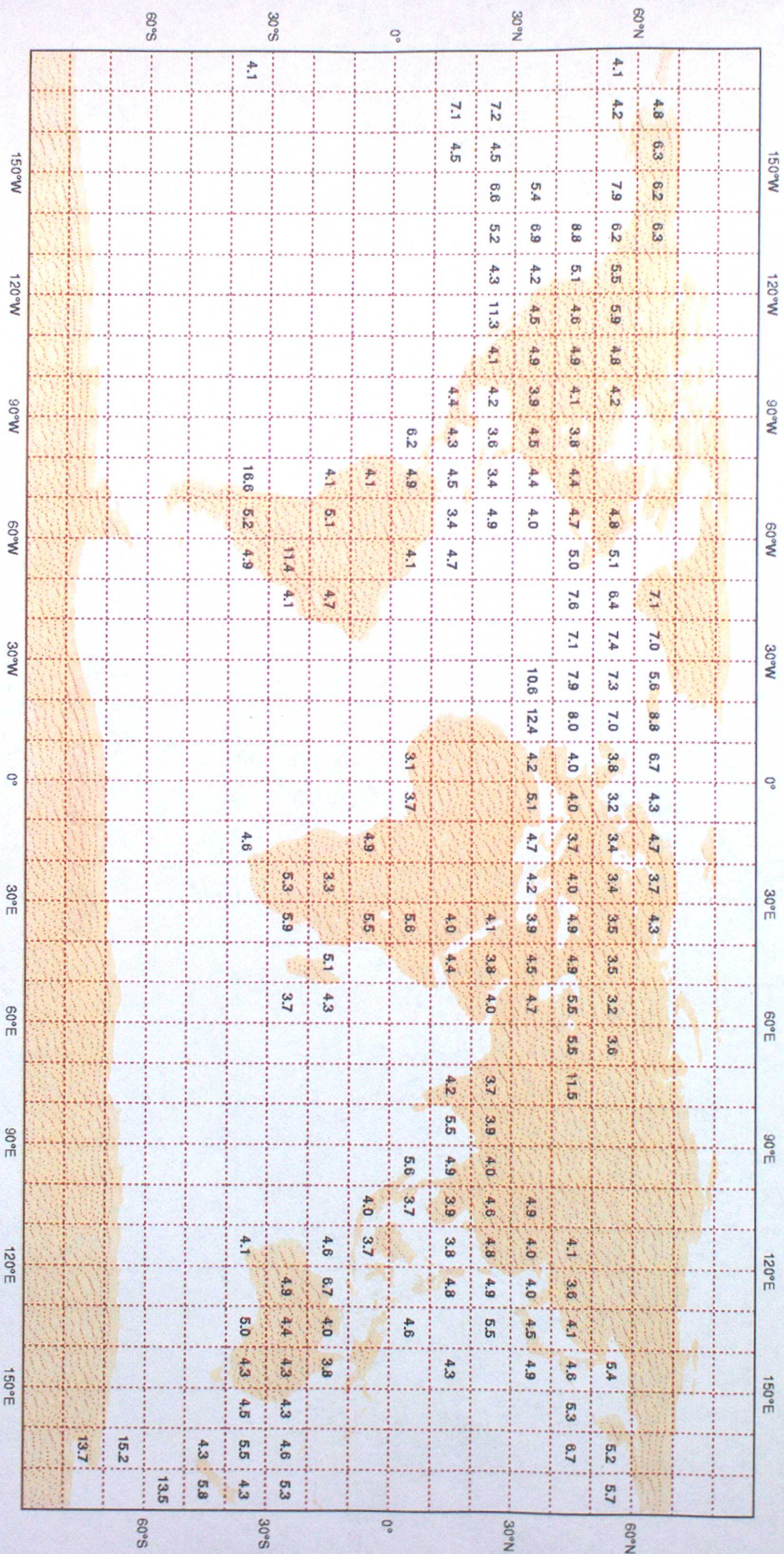


TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
21946	12	Z	50	71/ 148	17	4	85.7	-260.7	274.4	11
24343	00	Z	50	67/ 123	24	0	107.9	-175.2	205.7	12
24944	00	Z	1000	60/ 120	15	12	19.6	-76.3	78.7	12
25400	00	Z	850	66/ 151	30	0	6.4	-36.1	36.6	5
27199	12	Z	1000	59/ 50	26	4	32.0	-46.0	56.0	6
27612	00	Z	1000	56/ 38	17	12	28.3	-47.1	54.9	7
28722	00	Z	30	55/ 56	11	0	156.2	120.9	197.5	4
30054	12	Z	1000	59/ 113	1	26	0.0	-92.0	92.0	10
30758	00	Z	100	52/ 113	16	0	58.3	-93.3	110.0	6
31369	00	Z	1000	53/ 141	21	5	9.8	-71.7	72.4	4
33041	00	Z	1000	52/ 31	13	1	26.1	-23.1	34.8	4
34009	00	Z	1000	52/ 36	15	13	24.7	-62.4	67.1	9
34009	12	Z	1000	52/ 36	14	15	31.4	-56.9	65.0	6
42101	00	Z	150	30/ 76	13	0	81.6	-83.3	116.6	6
42101	12	Z	200	30/ 76	14	1	44.0	-82.7	93.7	4
42182	00	Z	1000	29/ 77	17	9	11.2	-76.3	77.1	5
42182	12	Z	1000	29/ 77	16	14	12.2	-77.9	78.8	8
42314	00	Z	1000	27/ 95	1	22	0.0	-94.0	94.0	5
42314	12	Z	150	27/ 95	11	1	46.6	-188.0	193.7	6
42339	00	Z	1000	26/ 73	9	18	8.7	-89.3	89.8	8
42339	12	Z	1000	26/ 73	1	22	0.0	-95.0	95.0	8
42361	00	Z	1000	26/ 78	15	3	13.8	-69.1	70.4	5
42361	12	Z	1000	26/ 78	14	7	13.2	-77.3	78.4	6
42369	00	Z	150	27/ 81	17	3	42.0	-176.1	181.0	8
42369	12	Z	200	27/ 81	18	1	89.6	-91.4	128.0	8
42410	00	Z	1000	26/ 92	16	9	10.8	-86.0	86.7	7
42410	12	Z	1000	26/ 92	6	16	7.5	-93.8	94.1	7
42667	00	Z	150	23/ 77	10	0	39.6	-165.9	170.6	5
42701	00	Z	150	23/ 85	23	2	84.9	-86.8	121.4	5
42701	12	Z	150	23/ 85	20	1	122.0	-58.9	135.5	7
42724	12	Z	150	24/ 91	18	0	60.1	-159.6	170.5	5
42809	00	Z	200	23/ 88	19	1	41.9	-135.1	141.4	9
42809	12	Z	100	23/ 88	23	0	98.1	-182.7	207.3	8
42867	00	Z	150	21/ 79	16	0	130.0	-90.0	158.1	7
42867	12	Z	150	21/ 79	15	2	98.8	-67.4	119.6	7
42971	12	Z	100	20/ 86	16	1	58.8	-181.8	191.1	6
43003	00	Z	200	19/ 73	24	1	56.6	-155.9	165.8	11
43003	12	Z	1000	19/ 73	30	0	12.7	-49.5	51.1	4
43041	00	Z	150	19/ 82	13	1	69.3	-157.5	172.0	5
43041	12	Z	150	19/ 82	13	2	63.6	-141.2	154.9	5
43128	00	Z	150	17/ 78	11	1	49.3	-164.5	171.7	4
43150	00	Z	1000	18/ 83	27	0	27.9	-53.5	60.3	7
43192	00	Z	1000	15/ 74	17	10	8.0	-87.6	88.0	9
43192	12	Z	1000	15/ 74	8	21	5.8	-93.5	93.7	8
43285	00	Z	250	13/ 75	19	1	73.2	-79.3	107.9	7
43285	12	Z	150	13/ 75	21	0	99.0	9.3	99.4	4
43295	00	Z	150	13/ 78	16	0	69.8	-84.7	109.7	5
43333	00	Z	150	12/ 93	19	0	45.6	-146.7	153.6	5
43333	12	Z	100	12/ 93	15	1	62.2	-186.1	196.3	5
43346	00	Z	150	11/ 80	19	3	66.8	-155.9	169.6	6
43353	00	Z	1000	10/ 76	26	0	13.2	-71.8	73.0	5
43353	12	Z	1000	10/ 76	24	2	8.3	-84.0	84.4	4
43369	00	Z	400	8/ 73	28	1	49.9	48.3	69.5	7
43369	12	Z	400	8/ 73	27	1	48.9	58.2	76.0	6
43371	00	Z	100	8/ 77	22	2	98.9	-180.0	205.4	7

89062	12	Z	1000	-68/	-68	6	7	18.2	-70.8	73.1	6
89512	12	Z	50	-71/	12	12	0	74.1	153.3	170.3	4
97560	00	Z	500	-1/	136	9	0	36.6	-34.2	50.1	4

Figure 8. TEMP 500 hPa geopotential mean daily count. DECEMBER 2004
All hours
Global average number of observations in 24 hours = 1179

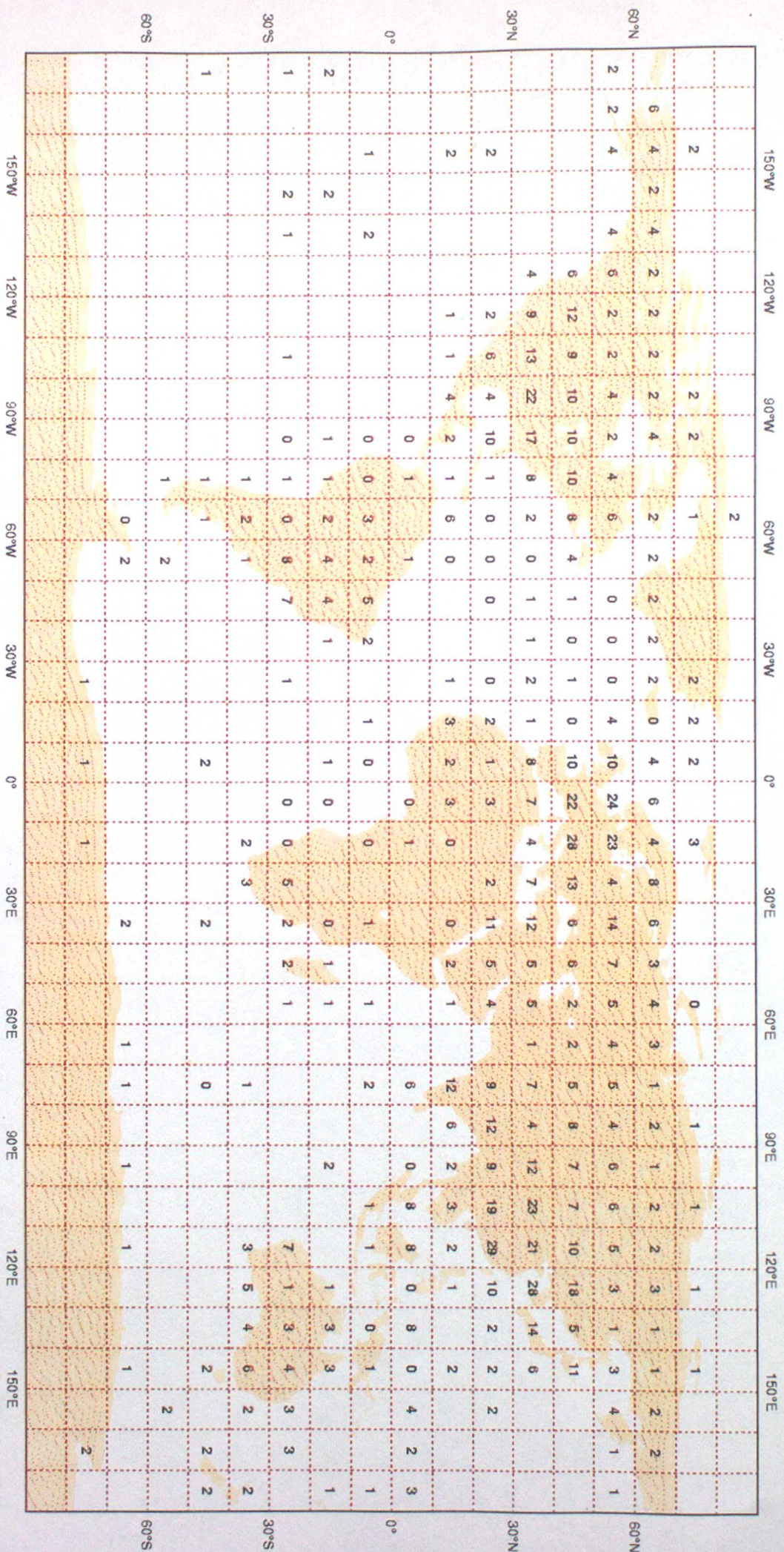


TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 100.0 hPa
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.2	
SELECTION CRITERIA	: ≥ 10 observations and $\geq 15 \text{ m s}^{-1}$ RMS vector wind.	
	ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN	

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
12843	00	V	300	47/ 19	30	0	3	-2.1	-2.2	15.2	1
42182	00	V	150	29/ 77	22	1	100	-10.6	-12.8	18.5	3
42182	12	V	200	29/ 77	21	0	100	-11.6	-2.6	19.3	3
42339	00	V	150	26/ 73	18	0	100	-13.8	0.9	18.2	2
42369	00	V	100	27/ 81	17	0	100	-15.2	-2.1	19.0	2
42701	00	V	150	23/ 85	25	0	100	-18.0	3.8	22.9	4
42701	12	V	150	23/ 85	21	0	100	-17.2	0.5	19.8	3
42809	00	V	150	23/ 88	18	0	55	-11.4	0.6	25.7	1
47058	00	V	400	39/ 126	15	0	6	-6.1	-6.6	16.3	1
56146	00	V	150	32/ 100	10	0	100	15.2	0.1	19.3	1
58968	00	V	250	25/ 122	28	0	100	-2.4	-13.6	15.6	2
58968	12	V	200	25/ 122	30	0	100	-0.7	-14.3	15.8	3
60360	12	V	150	37/ 8	14	0	100	5.2	-2.7	23.0	4
60620	12	V	250	28/ 0	11	0	100	-26.0	-7.9	29.6	4
62337	00	V	200	31/ 34	23	0	100	-6.8	15.0	21.5	4
62337	12	V	200	31/ 34	25	0	100	-10.8	12.3	23.2	5
62378	12	V	150	30/ 31	29	0	100	-5.4	3.8	16.9	1
62403	12	V	200	26/ 33	25	0	100	4.3	2.0	15.5	1
62414	00	V	150	24/ 33	24	0	100	-3.0	0.1	18.7	5
68512	12	V	200	-30/ 18	16	0	100	-4.2	0.0	16.4	2
76654	12	V	150	19/-104	20	0	5	-5.4	0.6	24.7	1
78486	12	V	250	18/ -70	21	0	4	-3.5	-1.1	18.4	1
78866	12	V	150	18/ -63	15	0	20	-1.3	-2.5	15.3	1
87623	12	V	150	-37/ -64	26	0	3	-3.6	-0.3	19.7	1
91165	00	V	150	22/-159	29	0	13	3.2	14.2	18.0	3
91165	12	V	200	22/-159	30	0	10	2.2	12.7	17.4	2
98223	00	V	150	18/ 121	28	0	25	5.6	7.5	16.3	1

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. DECEMBER 2004
All hours
Global average number of observations in 24 hours = 1315

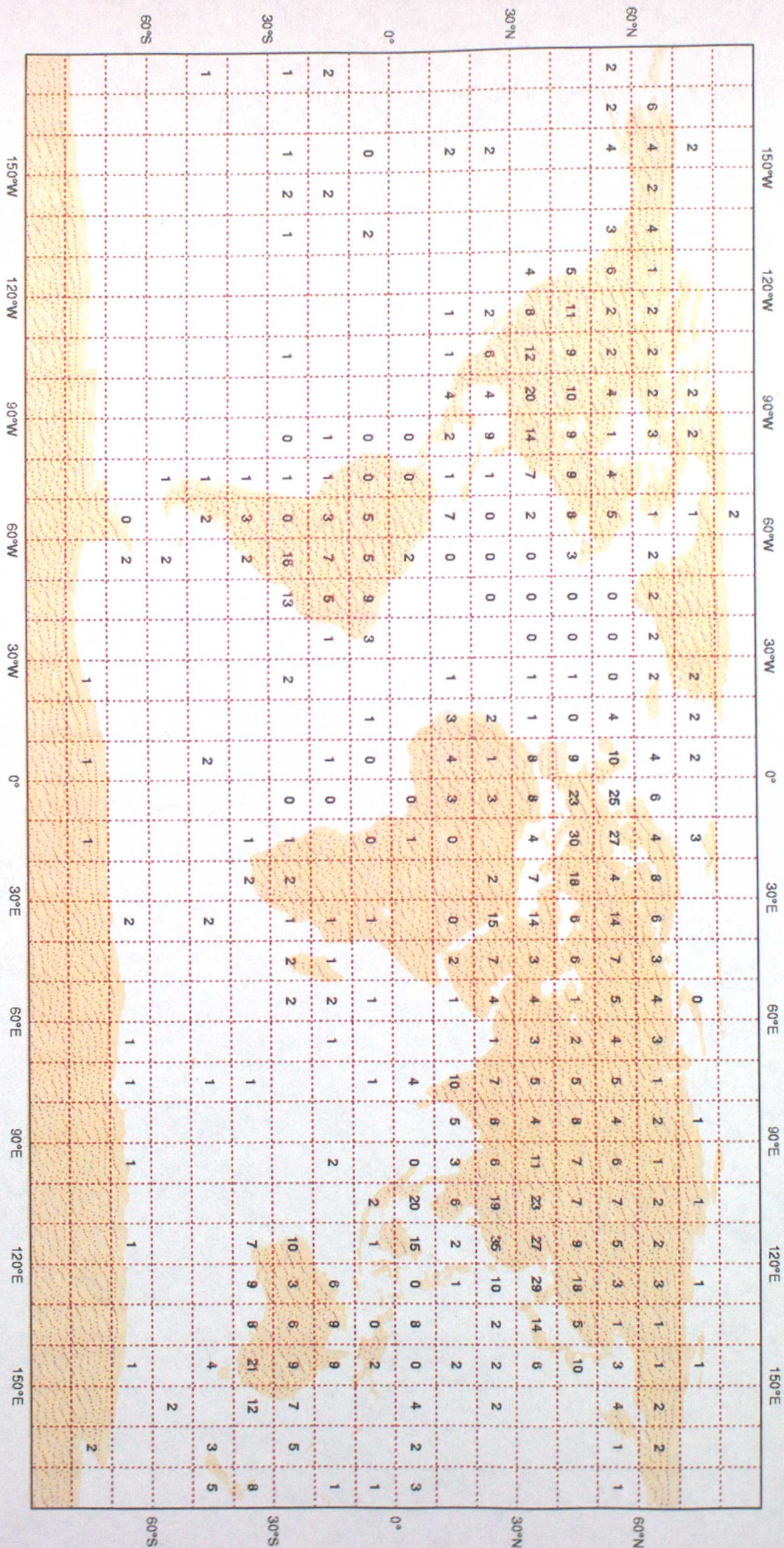


TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 500.0 - 150.0 hPa
Element monitored		:WIND DIRECTION in degrees
Parameters monitored		
	:NUM OBS	:Average number of observations at all levels.
	:BIAS	:Mean difference of observations from background values from all levels.
	:MAX SPREAD	:(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels
	:SD	:SD of difference of observations from background values at all levels.
SELECTION CRITERIA	:NUM OBS ≥ 5 , and ABSOLUTE BIAS $\geq 10^\circ$, with SD $< 30^\circ$, and MAX SPREAD $< 10^\circ$	

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
WAAH	00	DD	52/ 3	6	-12.4	9.2	24.5
33791	12	DD	48/ 33	28	-13.1	8.6	9.8
42182	00	DD	29/ 77	25	15.1	2.8	8.4
43295	12	DD	13/ 78	12	-14.2	7.7	21.3
58968	00	DD	25/ 122	27	17.9	3.8	7.1
58968	12	DD	25/ 122	30	18.2	4.2	6.8
62337	00	DD	31/ 34	23	-20.6	2.0	6.2
62337	12	DD	31/ 34	25	-18.2	5.2	10.0
89009	00	DD	-90/ 0	12	-12.9	8.5	17.2
91165	00	DD	22/-159	28	-31.0	7.6	14.1
91165	12	DD	22/-159	28	-31.1	2.5	10.9

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: EXETER

MONTH: Dec 2004

Monitoring procedures

Period	:One calendar month.
Data monitored	:Reports from GOES-9, GOES-10, GOES-12, METEOSAT-5, METEOSAT-7
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:number of observations > 10.
Data Extracted	:Layer 701 - 1000 hPa 401 - 700 hPa 101 - 400 hPa :Mean wind :Mean observation minus background vector wind differences :Mean observation minus background speed differences :RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. DECEMBER 2004
Global average number of observations in 24 hours = 93796

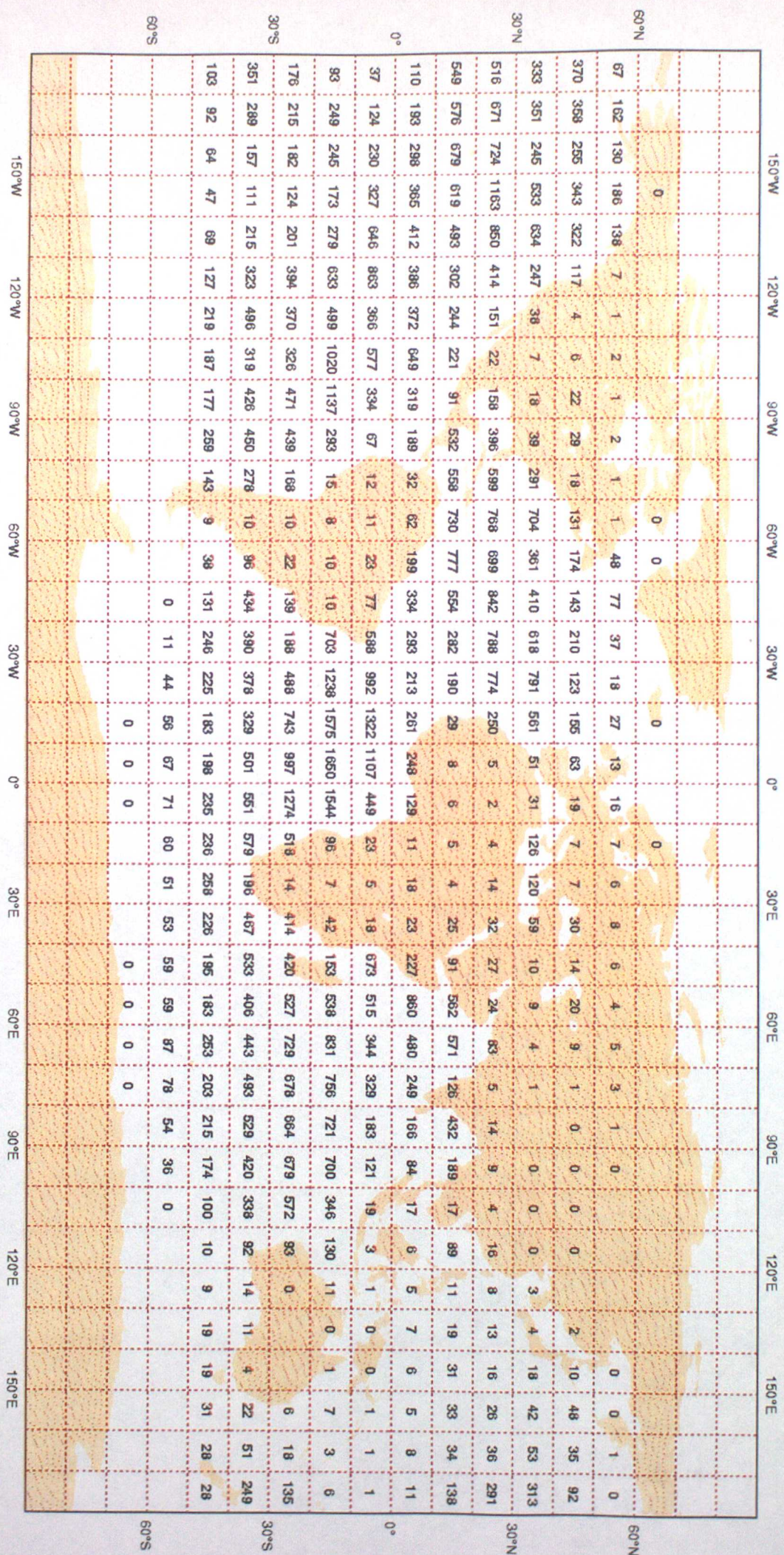


Figure 11. SATOB 701 - 1000 hPa vector mean wind. DECEMBER 2004
All observations
Arrows are plotted where greater than 10 obs are present

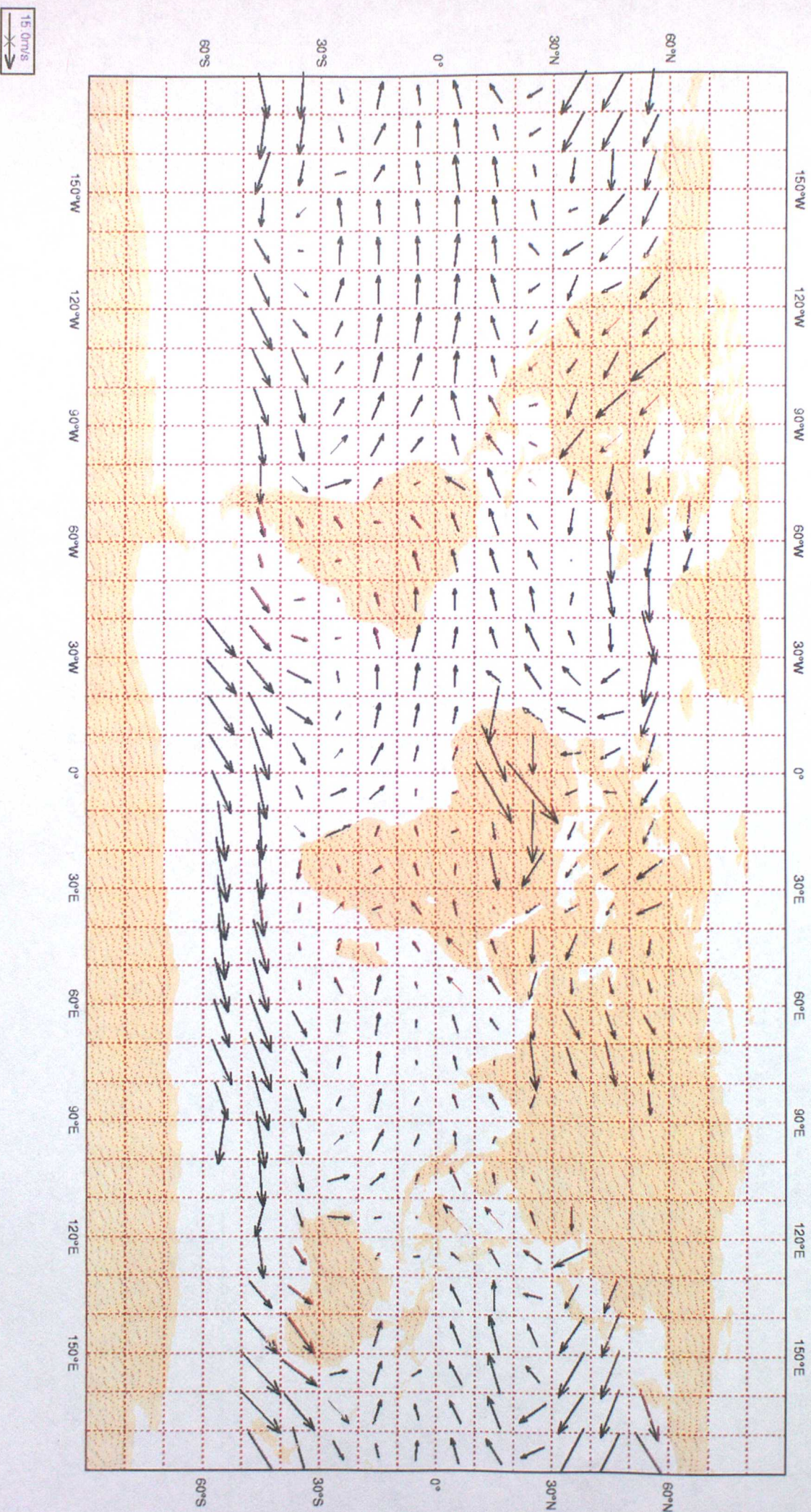
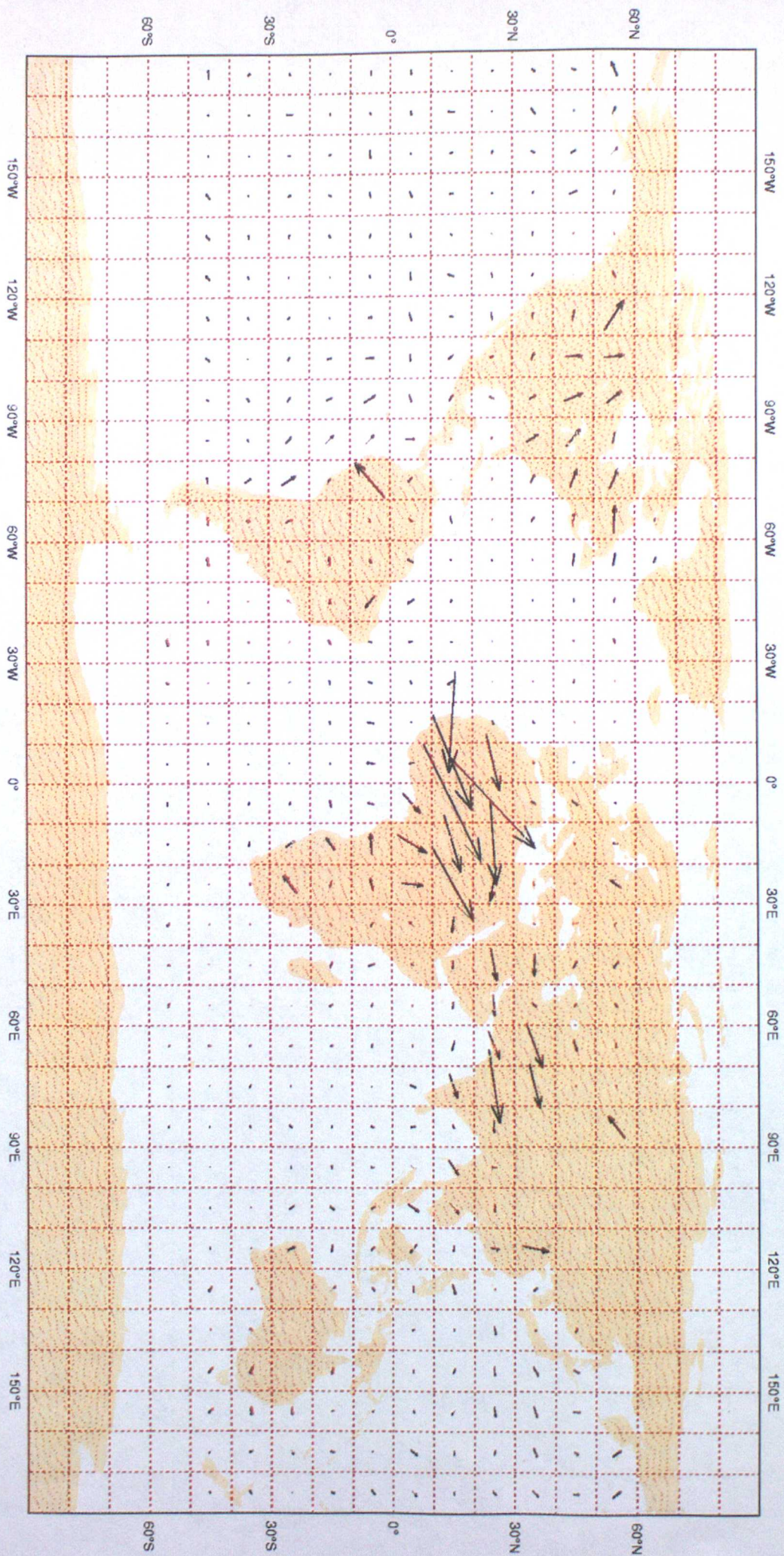


Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. DECEMBER 2004
All observations
Arrows are plotted where greater than 10 obs are present



Values are plotted where greater than 10 obs are present

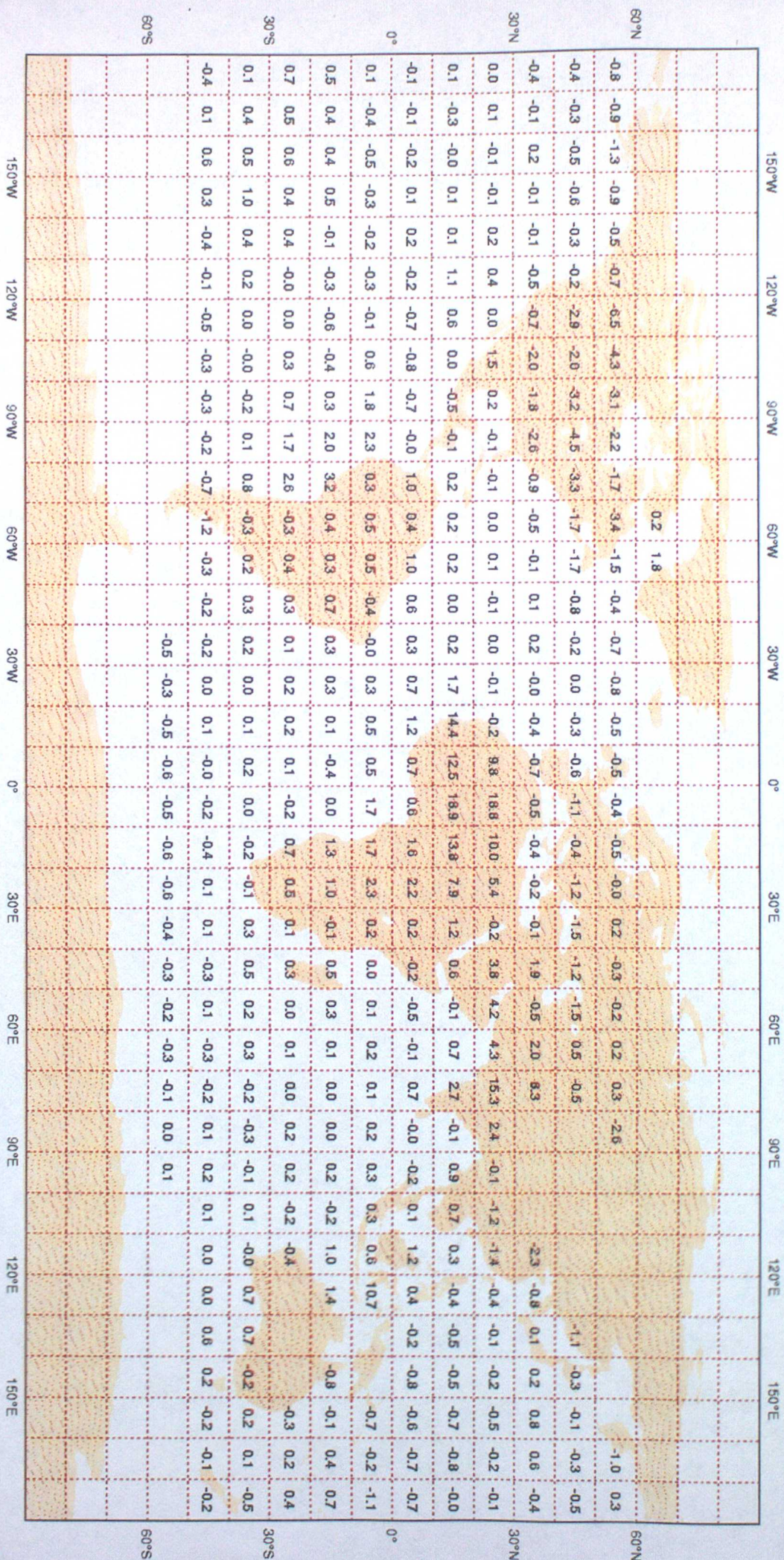


Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). DECEMBER 2004
 All observations
 Values are plotted where greater than 10 obs are present

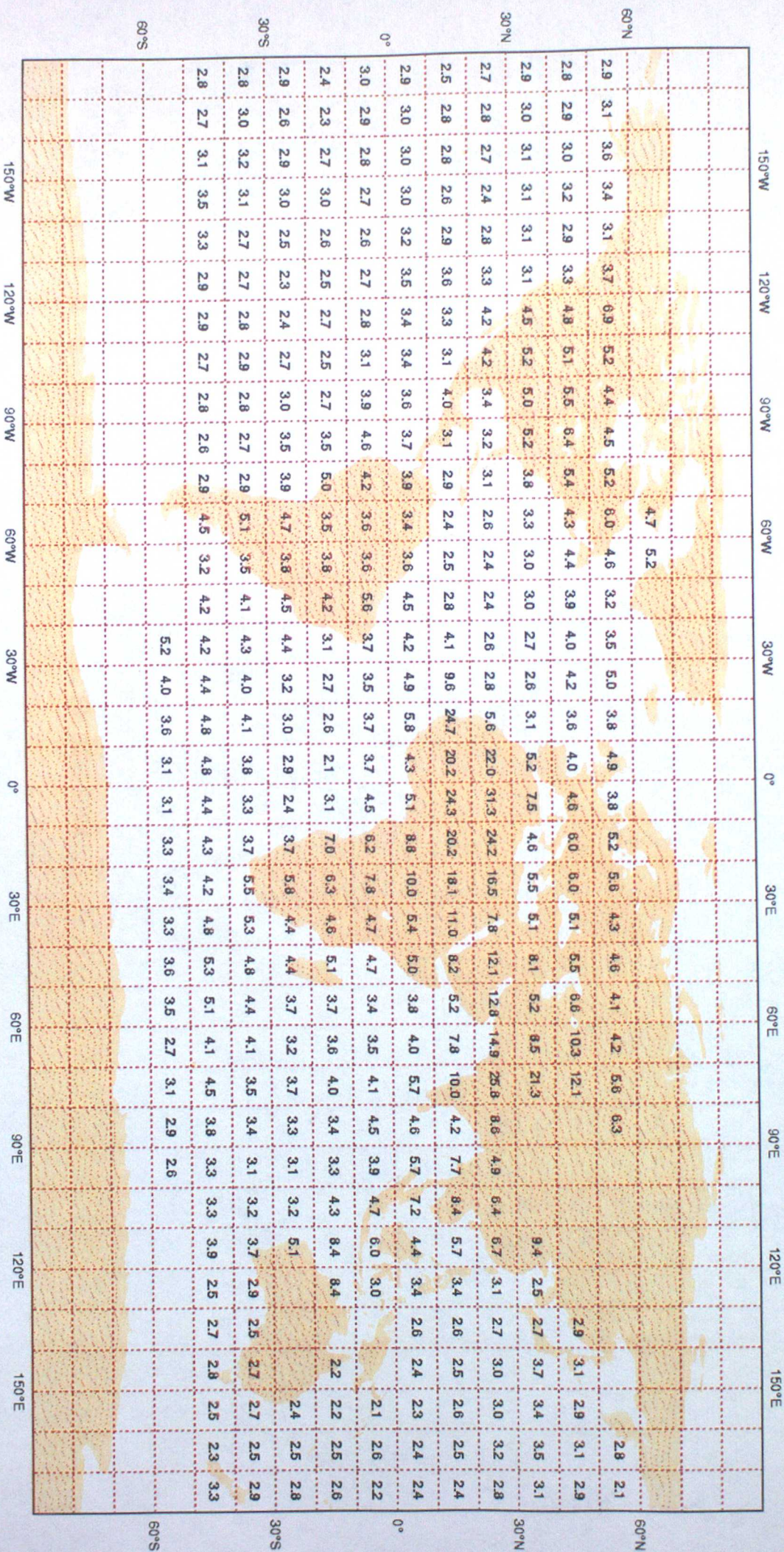


Figure 15. SATOB 401 - 700 hPa mean daily count. DECEMBER 2004
Global average number of observations in 24 hours = 23804

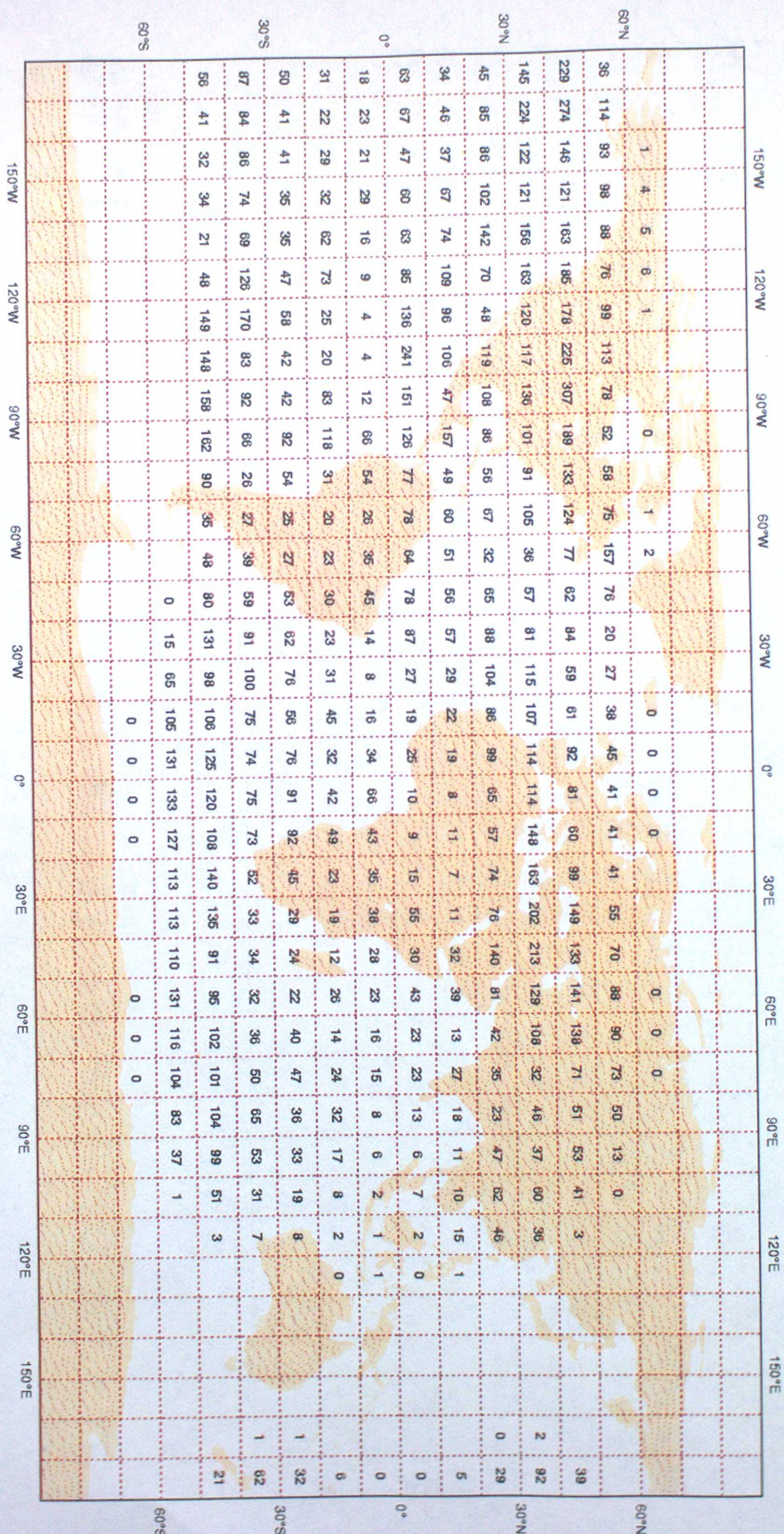


Figure 16. SATOB 401 - 700 hPa vector mean wind. DECEMBER 2004
All observations
Arrows are plotted where greater than 10 obs are present

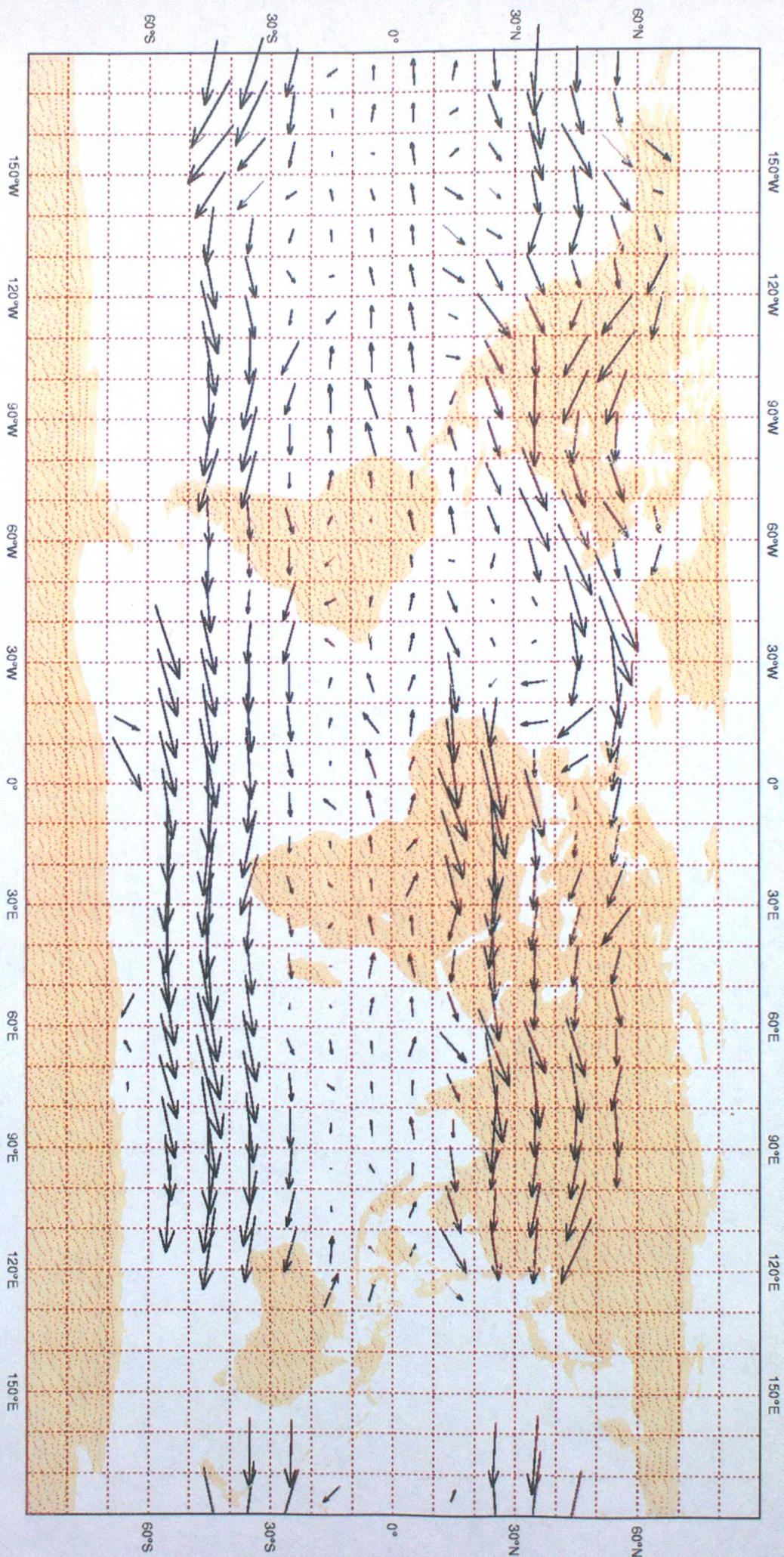
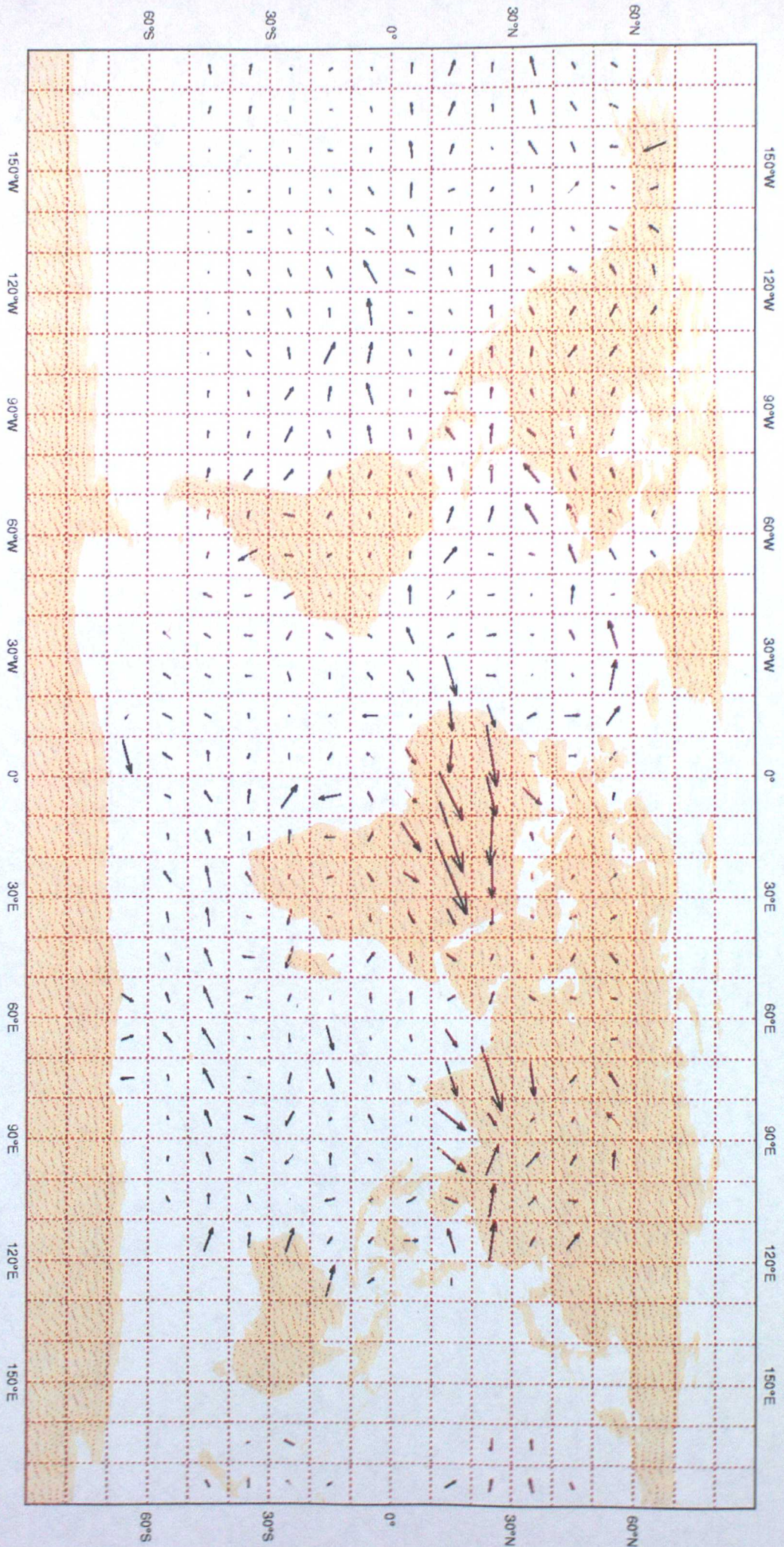


Figure 17. SATOB 401 - 700 hPa mean vector wind differences. DECEMBER 2004
All observations
Arrows are plotted where greater than 10 obs are present



10.0m/s
→

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). DECEMBER 2004
All observations
Values are plotted where greater than 10 obs are present

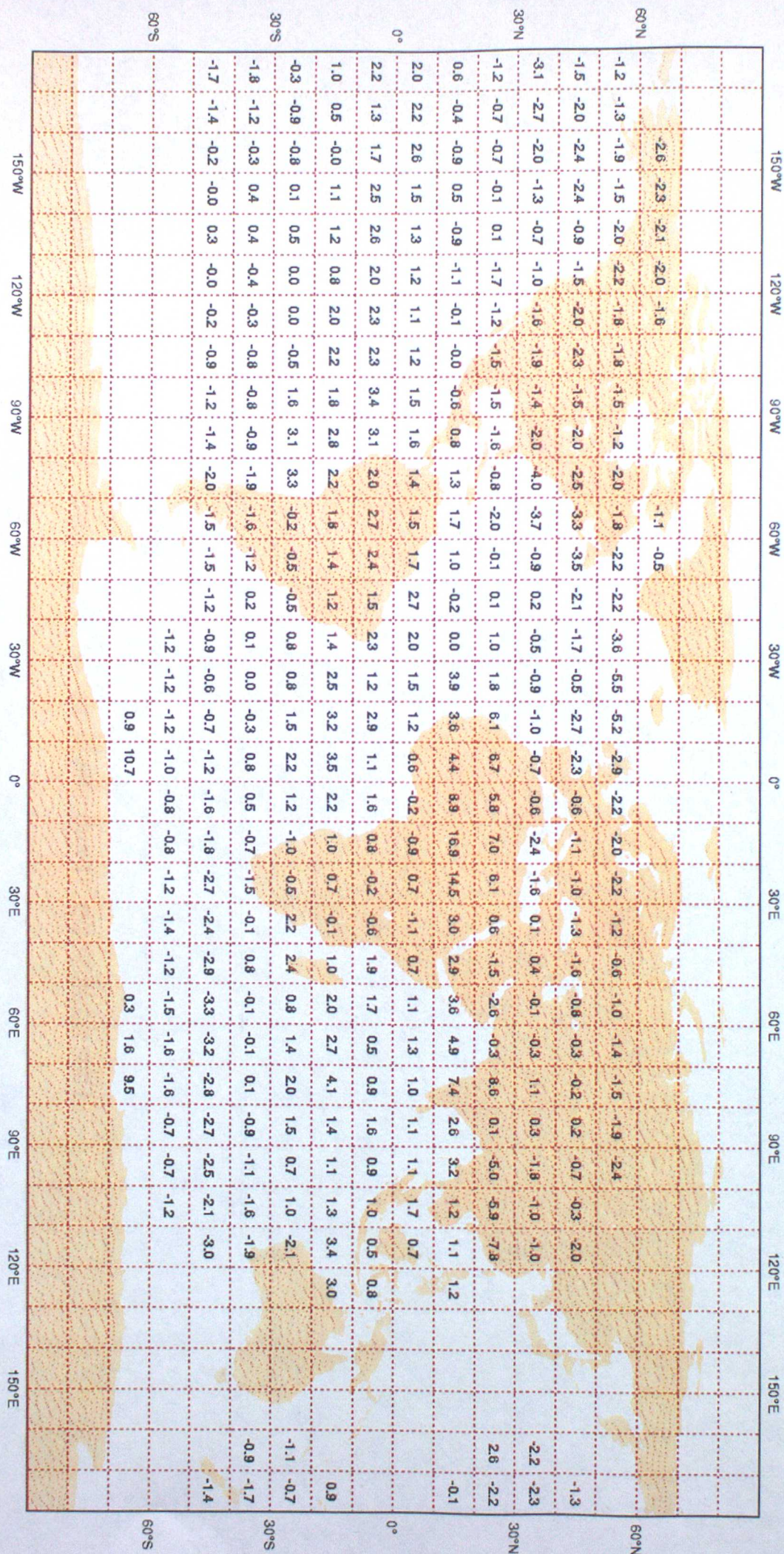


Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms^{-1}). DECEMBER 2004
All observations
Values are plotted where greater than 10 obs are present

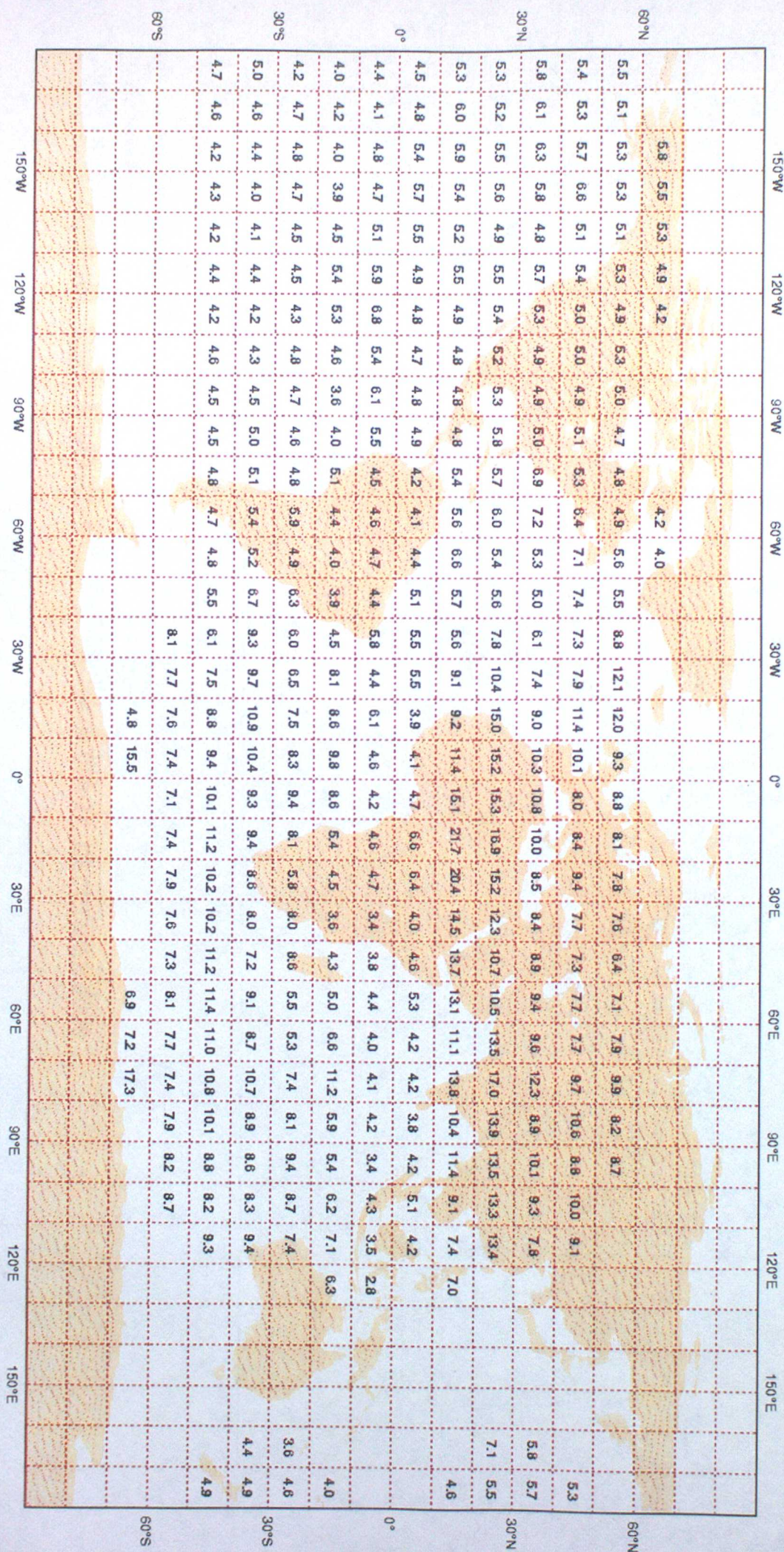


Figure 20. SATOB 101 - 400 hPa mean daily count. DECEMBER 2004
Global average number of observations in 24 hours = 219165

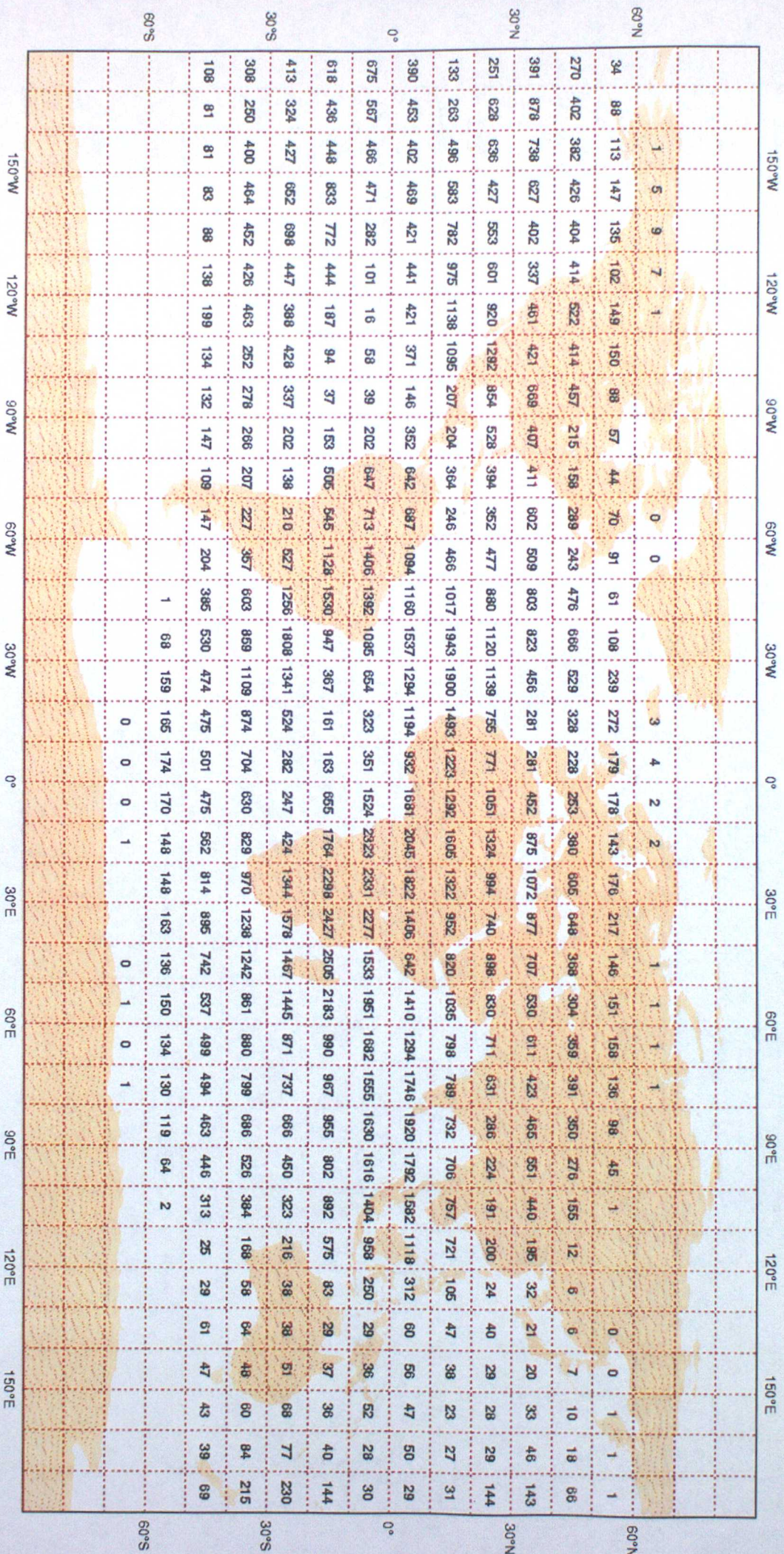


Figure 21. SATOB 101 - 400 hPa vector mean wind. DECEMBER 2004
All observations
Arrows are plotted where greater than 10 obs are present

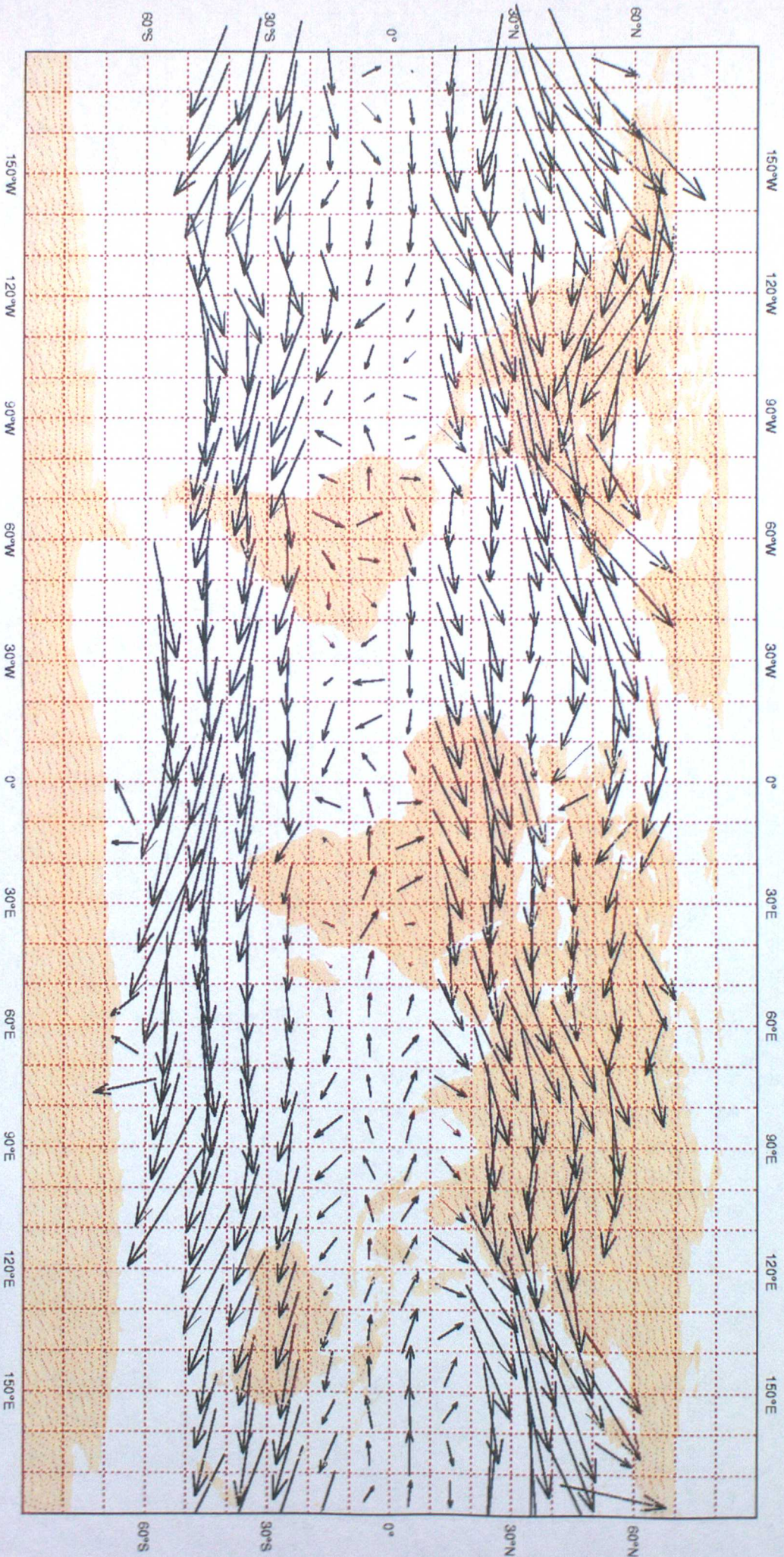
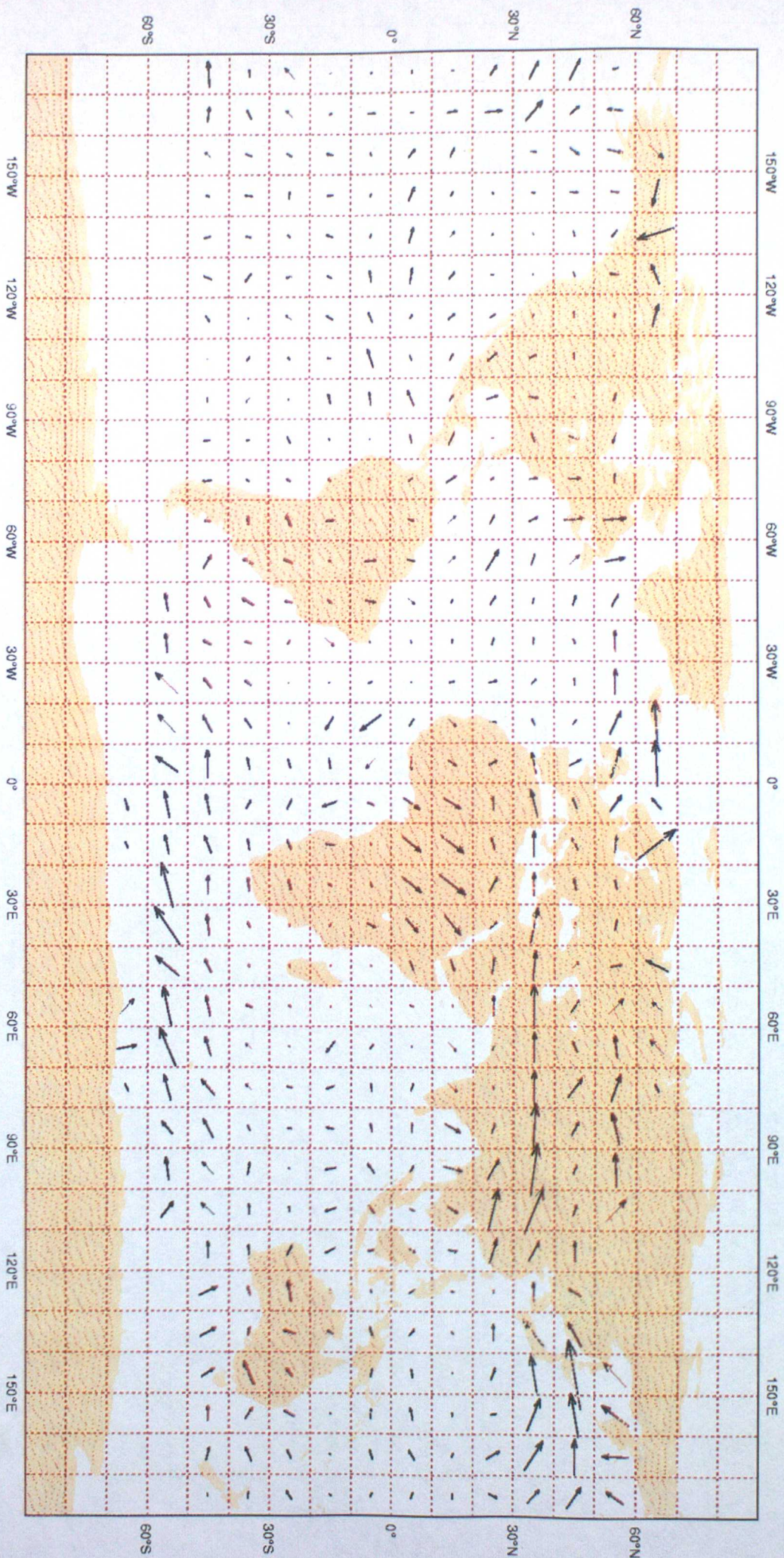


Figure 22. SATOB 101 - 400 hPa mean vector wind differences. DECEMBER 2004
All observations
Arrows are plotted where greater than 10 obs are present

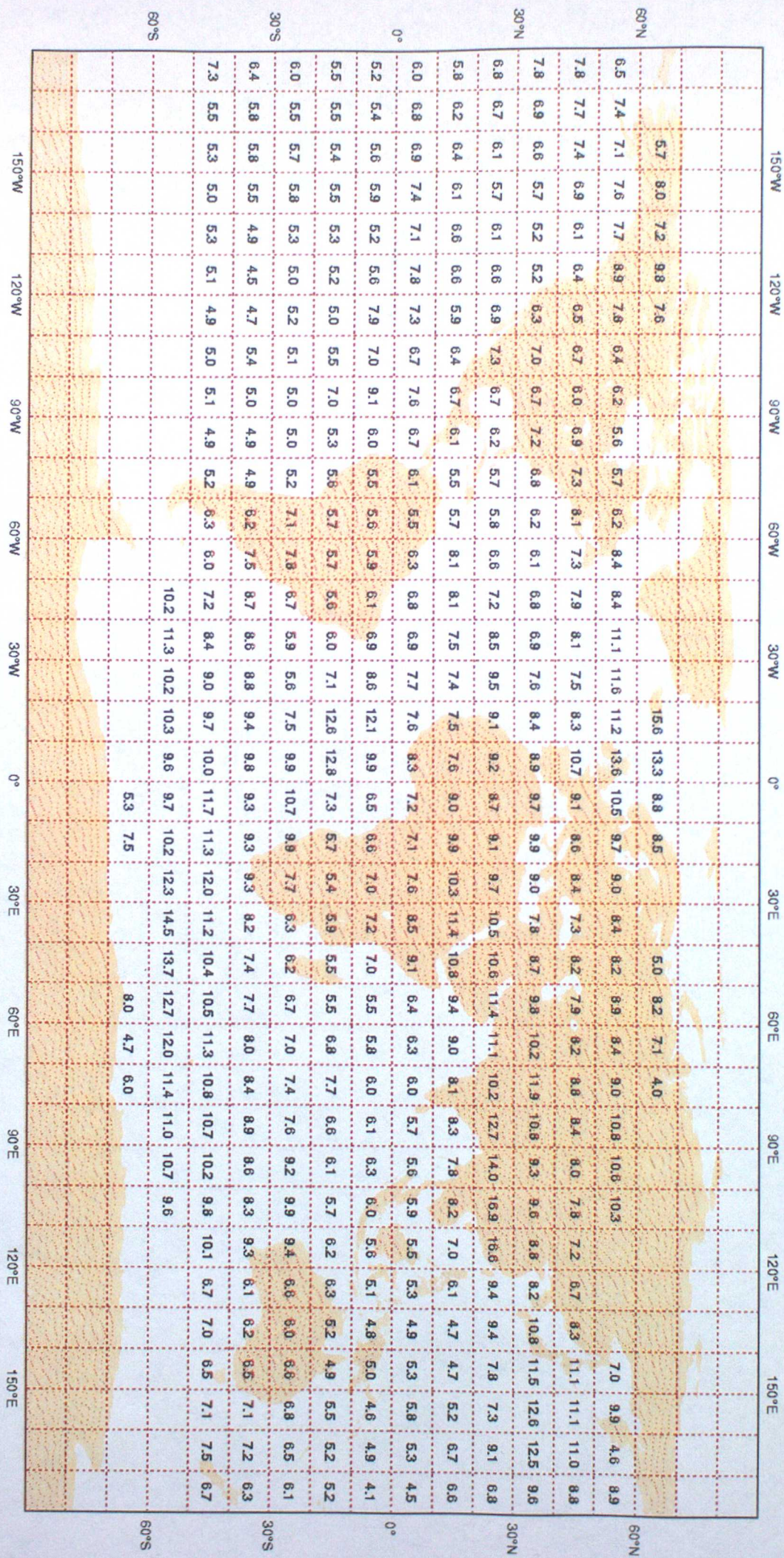


All observations

[illegible]

All observations

Values are plotted where greater than 10 obs are present



MONITORING OF SATELLITE TEMPERATURES

MONITORING CENTRE: EXETER

MONTH: Dec 2004

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from NOAA-15, NOAA-16 and NOAA-17.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :All soundings.

Data Extracted :Sounding channels (and approximate weighting function peaks, hPa)

HIRS8 (Surface)

HIRS15 (700)

HIRS11 (500-700)

HIRS4 (400)

AMSUA5 (700)

AMSUA7 (300)

AMSUA9 (100)

:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. DECEMBER 2004
NOAA15, using all observations
Global average number of observations in 24 hours = 662968

	150°W		120°W		90°W		60°W		30°W		0°		30°E		60°E		90°E		120°E		150°E															
60°N	470	472	477	482	488	500	492	474	416	283	255	307	392	375	342	379	411	429	431	429	439	434	438	445	447	438	438	442	466	464	466	468	473	478	473	470
	1295	1289	1285	1321	1362	1254	1137	1202	860	504	897	1049	1095	529	604	1268	1296	1306	1327	1308	1279	1270	1259	1229	1250	1253	1264	1119	1089	1265	1240	1294	1302	1307	1298	1283
	1067	1084	1055	1079	1025	1000	965	988	874	870	907	921	1144	849	1096	1212	1216	1207	1190	1152	1088	1052	1044	1056	1054	1157	1166	968	956	875	708	423	792	860	781	940
30°N	998	998	1044	1122	1174	1165	1132	1061	1044	1065	1053	1104	1139	1143	1136	1131	1128	1122	1097	1095	1055	977	979	1015	1064	1131	1150	1092	1077	907	983	957	1074	1055	1032	1022
	981	969	980	1062	1146	1155	1059	1084	1042	1029	1093	1116	1130	1117	1100	1108	1137	1096	1049	1053	1015	991	1029	1032	1065	1088	1025	961	962	1066	1122	1086	1062	1033	991	965
	986	1053	1055	1042	1105	1101	1052	1064	1036	1038	1090	1107	1096	1086	1081	1090	1117	1077	1046	1082	978	979	1041	1039	1057	1082	1100	1098	1105	1121	1116	1083	1047	1001	1039	988
0°	915	1091	1138	1097	1116	1092	1068	1056	1026	1058	1103	1105	1125	1066	1098	1086	1058	1038	1013	814	748	950	1093	1044	1020	1053	1088	1114	1126	1105	1115	1076	1028	984	1035	980
	881	1065	1121	1103	1134	1088	1077	1053	1022	1085	1099	1112	1114	1060	1098	1094	1063	1045	1028	814	720	1021	1129	1056	981	1046	1075	1091	1081	1074	1117	1083	1030	1001	1043	964
30°S	927	1052	1130	1137	1101	1073	1082	1051	1021	1098	1077	1116	1124	1065	1110	1105	1049	1044	1073	994	988	1104	1114	1074	1025	1051	1097	1089	1129	1088	1110	1129	1066	1011	1051	1028
	965	1018	1116	1140	1080	1064	1079	1038	1036	1116	1092	1137	1106	1031	1080	1104	1034	1038	1083	961	1017	1130	1129	1100	1032	1044	1114	1093	1139	1106	1107	1126	1068	1033	1035	1043
	1007	981	1110	1162	1057	1042	1076	1032	1048	1113	1101	1139	1101	1044	1066	1090	1019	1038	1080	947	1054	1151	1124	1108	1048	1031	1099	1092	1126	1120	1101	1125	1082	1062	1026	1047
0°	1025	935	1089	1167	1051	1034	1057	1036	1073	1100	1076	1126	1100	1065	1067	1090	983	1022	1018	946	1084	1161	1126	1107	1058	1030	1083	1083	1102	1122	1068	1070	1064	1076	1019	1038
30°S	1055	970	1053	1126	1052	1024	1043	1029	1076	1097	1105	1125	1090	1044	1052	1067	1011	986	981	979	1109	1161	1125	1097	1075	1044	1069	1109	1118	1125	1119	1098	1090	1099	1017	1050
	1072	1004	1027	1090	1063	1031	1033	1075	1123	1133	1151	1138	1107	1094	1065	1056	1065	1046	1013	1042	1144	1175	1152	1117	1102	1070	1074	1116	1132	1146	1138	1122	1139	1123	1074	1074
60°S	1099	1055	1046	1069	1082	1061	1054	1102	1152	1167	1169	1157	1139	1128	1091	1073	1068	1051	1052	1115	1189	1202	1192	1165	1141	1107	1101	1123	1150	1161	1152	1153	1165	1160	1121	1111
	1177	1140	1101	1090	1102	1121	1147	1183	1220	1232	1225	1198	1203	1178	1150	1129	1121	1131	1170	1223	1271	1282	1278	1260	1235	1201	1186	1168	1172	1197	1208	1216	1219	1240	1224	1202
	1282	1273	1265	1248	1248	1259	1282	1319	1337	1301	1250	1221	1208	1264	1234	1257	1263	1341	1371	1373	1386	1411	1336	1289	1405	1403	1377	1258	1290	1268	1220	1308	1283	1279	1338	1309
	451	436	452	462	468	468	471	472	474	471	465	414	414	429	450	486	501	506	507	508	514	519	514	499	492	490	498	508	513	510	509	507	499	493	483	472

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations

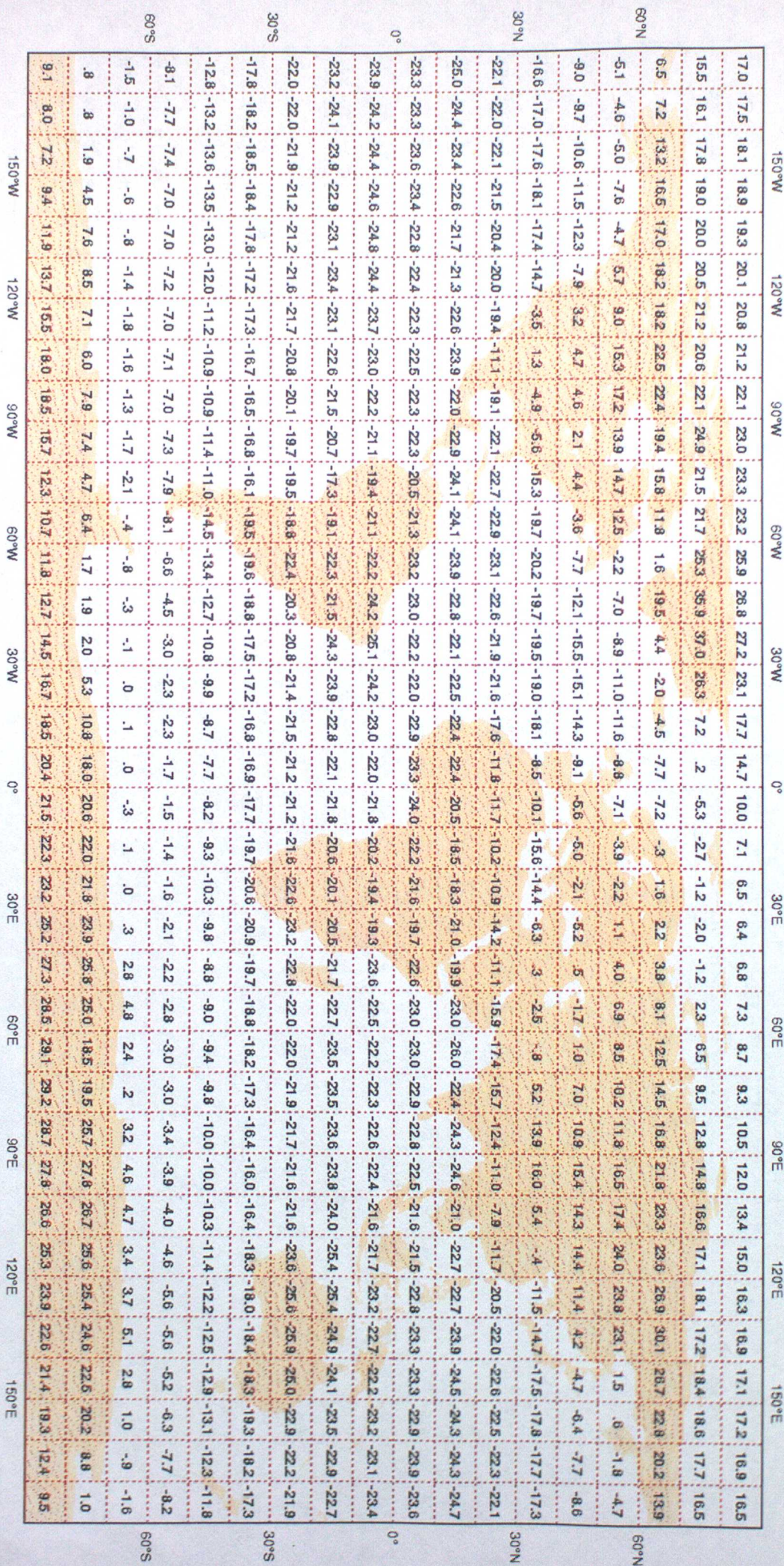


Figure 27. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS8 (Surface)
NOAA15, using all observations

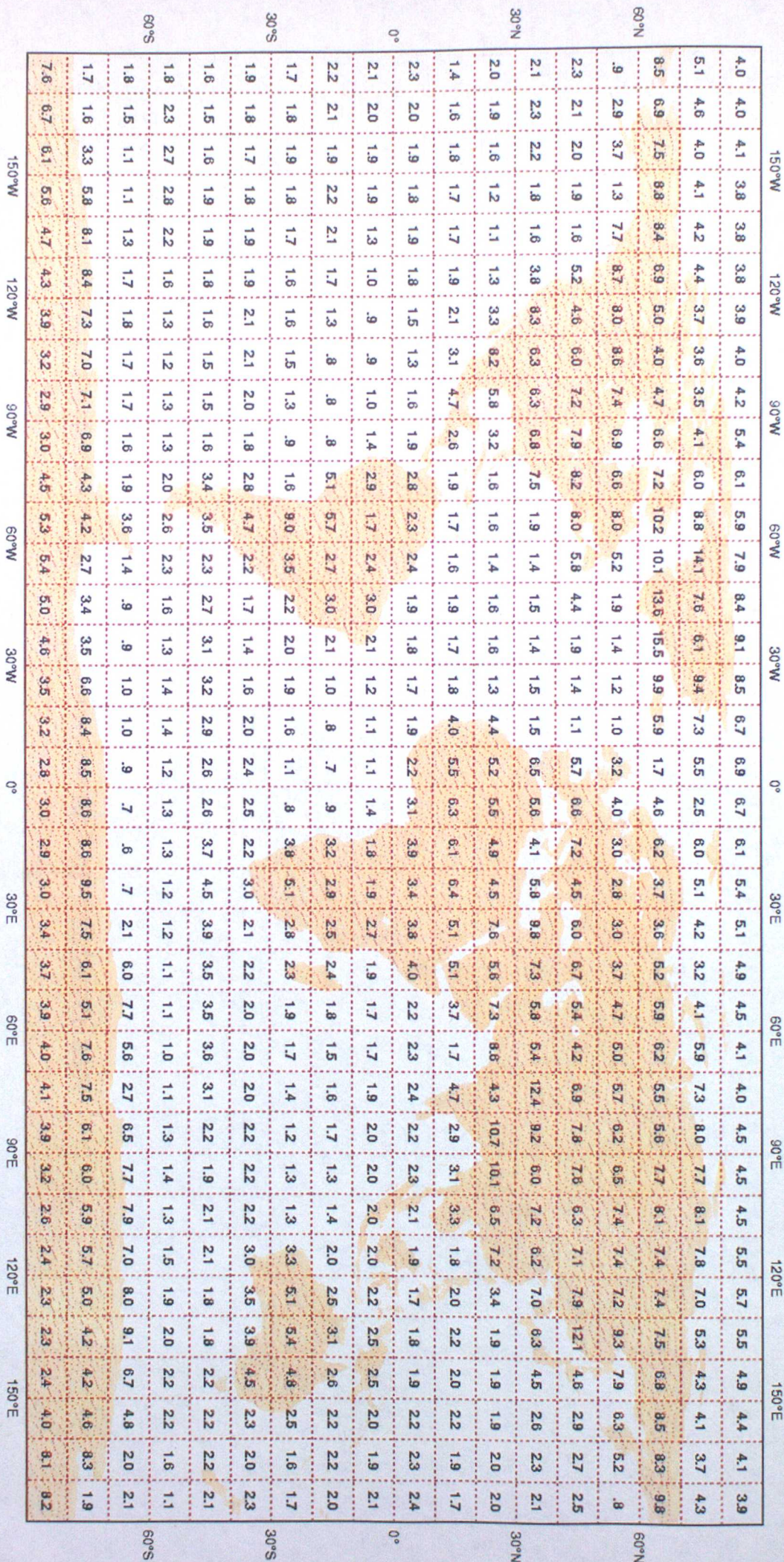


Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

	150°W					120°W					90°W					60°W					30°W					0°					30°E					60°E					90°E					120°E					150°E				
60°N	12.8	11.7	11.6	11.8	12.2	13.0	14.5	16.8	18.1	18.2	17.8	16.6	13.8	15.3	11.6	9.5	8.3	7.1	7.0	8.4	8.9	9.9	11.1	12.4	13.6	14.9	16.1	17.4	18.2	19.1	20.0	20.2	19.5	18.2	16.6	15.0																			
30°N	6.7	6.1	4.9	4.0	4.8	6.9	8.3	10.7	12.8	13.7	13.8	12.4	8.7	6.2	4.6	3.2	2.6	3.3	4.1	5.1	6.1	7.7	9.0	10.3	11.1	12.2	13.0	14.3	15.3	16.3	17.3	17.6	17.1	12.9	11.0	9.6	8.0																		
0°	3.0	2.2	1.4	.6	.5	1.3	4.5	5.5	6.4	7.0	7.0	4.6	2.4	.5	-.8	-1.0	-.5	1.3	2.8	2.9	4.1	4.7	6.0	6.2	6.5	7.7	8.9	10.0	10.6	11.3	11.5	10.2	7.8	6.5	5.1	4.2																			
30°S	-1.8	-2.6	-3.3	-3.4	-2.9	-2.4	1	1.5	3	.5	-1.6	-3.3	-4.2	-4.1	-3.7	-2.9	-2.1	3	3	-1.0	-5	12	2.6	2.6	2.2	3.8	6.7	7.5	4.7	3.9	1.8	3	-1.3	-1.7	-2.2	-2.0																			
60°S	-7.2	-7.0	-6.9	-5.8	-5.4	-5.7	-6.0	-4.6	-5.9	-6.9	-7.2	-7.3	-7.1	-6.4	-6.2	-5.6	-4.7	-4.1	-4.5	-4.3	-4.1	-4.9	-3.8	-4.6	-5.8	-6.6	-5.3	-4.5	-3.6	-4.2	-6.7	-7.9	-8.7	-9.5	-8.4	-8.0																			
	-10.1	-9.9	-9.2	-8.6	-8.5	-8.7	-9.2	-9.5	-8.9	-9.4	-9.8	-9.6	-9.2	-8.5	-8.6	-8.7	-9.0	-9.3	-9.5	-9.1	9.5	8.8	9.3	-10.0	-10.0	-10.3	-10.1	-9.4	-9.8	-10.4	-10.9	-11.0	-10.8	-10.9	-10.9	-10.8																			
	-10.7	-10.9	-10.6	-10.4	-10.1	-10.0	-10.1	-10.0	-9.9	-10.2	-9.7	-10.0	-10.2	-9.9	-9.8	-9.8	-10.1	-10.0	-10.4	-10.2	-10.2	-9.6	-10.0	-10.1	-10.2	-10.3	-10.4	-10.3	-10.3	-10.2	-10.7	-10.9	-10.9	-10.9	-11.3	-11.2																			
	-10.9	-11.1	-10.8	-10.6	-10.4	-10.3	-10.1	-10.1	-9.9	-9.9	-9.6	-10.1	-10.2	-10.2	-10.2	-10.1	-10.0	-9.9	-10.1	-9.6	-9.7	9.6	-10.3	-10.2	-10.2	-10.2	-10.5	-10.3	-10.4	-10.4	-10.7	-10.8	-10.6	-11.1	-11.1	-11.2																			
	-10.8	-10.6	-10.4	-10.2	-9.7	-9.3	-8.9	-8.1	-9.4	-9.7	-8.1	-9.8	-10.0	-9.6	-9.8	-9.6	-9.4	-9.6	-10.2	-9.9	-10.1	-10.0	-10.0	-10.0	-10.0	-10.0	-9.9	-10.0	-10.1	-10.5	-11.0	-10.9	-10.6	-10.8	-10.8																				
	-8.7	-8.3	-8.4	-8.5	-7.9	-7.2	-6.6	-6.5	-7.1	-7.8	-8.5	-9.2	-8.9	-8.0	-8.2	-8.3	-8.1	-8.1	-8.7	-9.3	-10.1	9.8	8.4	8.7	8.3	7.8	7.6	7.7	8.0	8.2	8.5	9.0	8.4	8.0	8.4																				
	-4.5	-4.4	-5.2	-5.8	-5.3	-4.5	-4.1	-3.5	-3.6	-3.8	-4.5	-6.1	-5.4	-4.8	-4.6	-4.8	-4.3	-4.0	-4.7	-5.9	-7.2	7.3	-6.7	-6.3	-5.8	-5.0	-4.3	-4.0	-4.1	-5.3	-5.4	-5.2	-5.0	-4.7	-3.8	-3.8																			
	-9	-9	-1.7	-2.6	-2.3	-1.6	-8	-3	-1	0	-2	-1.8	-1.8	-1.3	-3	2	6	7	6	0	-9	-1.3	-1.3	-9	-6	0	5	3	0	-9	-1.6	-1.7	-1.8	-1.0	-3	-3																			
	1.3	1.1	1.2	1.0	1.2	1.7	2.2	2.2	2.6	2.6	2.2	1.9	2.1	2.8	3.7	4.4	4.5	5.0	5.1	4.6	4.3	3.9	3.8	3.8	3.8	3.7	3.5	3.2	3.0	2.3	1.5	1.4	1.4	1.6	1.8	1.7																			
	3.5	3.4	3.6	3.8	3.7	3.8	3.8	3.8	4.1	4.2	4.2	4.6	4.8	5.3	5.7	6.1	6.3	6.5	6.3	5.9	5.6	5.5	5.8	6.1	5.5	4.7	5.0	5.3	5.2	4.8	4.7	4.7	4.2	3.9	3.7	3.5																			
	4.7	4.7	5.0	5.4	5.9	6.1	5.9	5.8	6.2	6.1	5.7	6.1	5.6	5.7	5.8	6.4	7.5	8.9	9.7	10.1	10.1	10.5	10.6	10.4	8.6	8.7	10.2	10.7	10.3	9.9	9.7	9.3	8.5	7.8	6.8	4.8																			
	6.2	6.0	6.9	6.2	6.6	7.0	7.5	8.1	8.3	7.7	7.1	6.9	7.1	7.3	7.6	8.0	8.4	8.9	9.2	9.5	9.8	10.3	10.9	11.1	11.3	11.2	11.0	10.7	10.3	9.8	9.3	8.9	8.4	7.8	6.7	6.2																			

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations

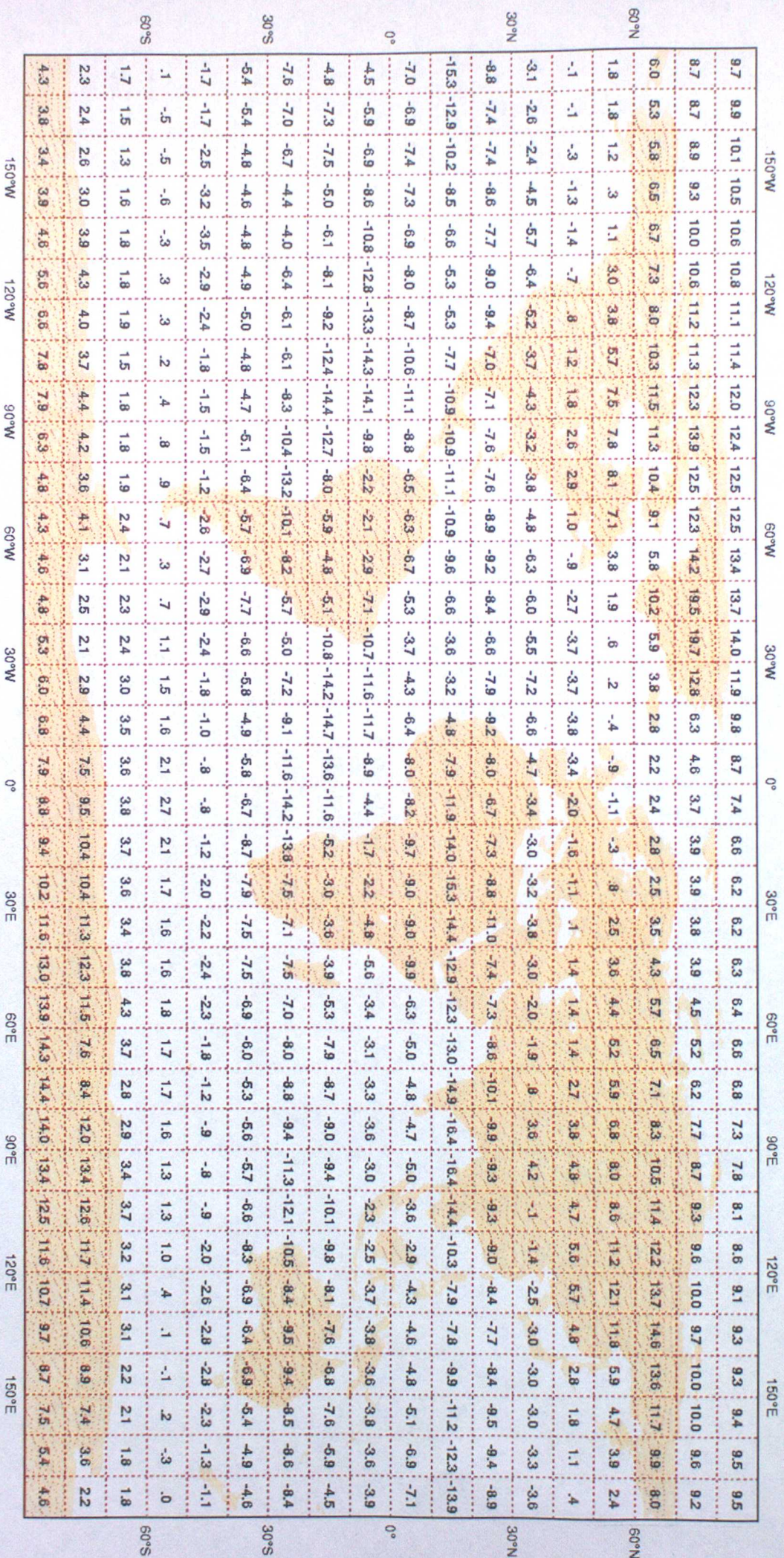


Figure 31. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

	150°W										120°W										90°W										60°W										30°W										0°										30°E										60°E										90°E										120°E										150°E									
60°N	13.1	13.0	12.9	12.8	12.8	12.7	12.6	12.5	12.5	13.1	13.6	13.2	12.6	12.5	12.7	12.8	12.6	12.2	11.9	12.0	11.9	12.0	12.2	12.4	12.6	12.8	13.1	13.3	13.4	13.5	13.6	13.6	13.5	13.5	13.4	13.3																																																																										
30°N	10.4	10.1	9.9	9.9	10.0	10.2	10.5	10.7	11.3	11.7	11.1	11.0	11.2	11.6	10.8	10.0	9.5	9.1	9.0	9.0	9.3	9.6	10.1	10.6	11.1	11.6	12.0	12.3	12.5	12.6	12.7	12.6	12.3	11.9	11.4	10.9																																																																										
0°	4.8	4.4	4.2	4.5	5.1	5.8	6.5	7.2	7.8	7.8	7.8	7.7	6.9	6.5	6.3	6.2	6.1	6.4	6.7	6.8	7.2	7.8	8.2	8.7	9.4	9.9	10.1	10.4	10.4	9.8	9.4	8.6	7.9	6.5	5.4																																																																											
30°S	-3	-4	-2	5	1.5	2.6	3.5	4.0	4.5	4.8	4.6	4.2	3.8	3.7	4.0	4.2	4.4	4.5	4.7	4.7	4.8	5.1	5.4	5.7	5.9	6.3	6.7	6.7	6.2	5.2	4.1	2.9	1.8	.9	.1																																																																											
60°S	-2.0	-1.8	-1.0	-3	.3	1.2	2.2	2.5	2.5	2.3	2.1	2.1	2.1	2.4	2.6	2.6	2.6	2.6	2.7	2.7	2.9	2.9	2.7	2.7	2.8	2.9	3.1	3.0	2.8	2.2	1.3	.3	-7	-1.2	-1.9																																																																											
30°N	-1.3	-1.1	-5	.0	2	.5	.9	1.1	1.0	.9	.6	.6	.7	.8	.9	.9	.7	.7	.7	1.1	.9	.7	.5	.5	.7	1.0	1.0	.5	2	-.3	-.8	-1.1	-1.1	-1.3	-1.2																																																																											
0°	-1.5	-1.2	-.8	-.4	-.3	-.4	-.5	-.4	-.4	-.7	-.8	-.8	-.8	-.6	-.7	-.6	-.6	-.6	-.7	-.5	-.8	-.8	-.9	-1.1	-1.3	-1.3	-1.4	-1.4	-1.5	-1.8	-1.9	-2.0	-1.8	-1.9	-1.7																																																																											
30°S	-2.2	-2.1	-1.7	-1.5	-1.5	-1.4	-1.5	-1.6	-1.8	-1.8	-1.8	-1.9	-1.8	-1.5	-1.5	-1.4	-1.5	-1.7	-1.9	-1.8	-1.9	-1.9	-2.0	-2.2	-2.2	-2.3	-2.3	-2.4	-2.3	-2.4	-2.4	-2.5	-2.4	-2.5	-2.5																																																																											
60°S	-2.3	-2.5	-2.3	-2.2	-2.1	-2.0	-2.1	-2.1	-2.2	-2.1	-2.2	-2.1	-1.9	-1.8	-1.9	-2.0	-2.0	-2.1	-2.1	-2.1	-2.1	-2.2	-2.1	-2.0	-2.1	-2.2	-2.1	-2.2	-2.1	-2.2	-2.3	-2.4	-2.4	-2.6	-2.6																																																																											
30°N	-2.4	-2.5	-2.4	-2.3	-2.2	-2.3	-2.3	-2.3	-2.3	-2.3	-2.0	-2.1	-2.0	-2.0	-2.2	-2.2	-2.2	-2.1	-1.9	-2.1	-2.2	-2.2	-2.1	-2.1	-2.1	-2.2	-2.1	-2.2	-2.1	-2.2	-2.3	-2.4	-2.3	-2.5	-2.5																																																																											
0°	-2.6	-2.5	-2.4	-2.3	-2.0	-1.9	-1.8	-1.9	-2.2	-2.4	-2.3	-2.2	-2.1	-2.1	-2.2	-2.2	-2.4	-2.6	-2.3	-2.5	-2.4	-2.3	-2.3	-2.3	-2.3	-2.3	-2.4	-2.5	-2.7	-2.6	-2.7	-2.8	-2.7	-2.7	-2.7																																																																											
30°S	-2.5	-2.1	-2.3	-2.2	-2.0	-1.7	-1.5	-1.4	-1.7	-1.8	-2.2	-2.4	-2.3	-2.2	-2.1	-2.2	-2.1	-2.5	-2.4	-2.5	-2.6	-2.4	-2.2	-2.0	-1.9	-2.0	-2.1	-2.2	-2.2	-2.2	-2.1	-2.3	-2.3	-2.4	-2.3	-2.5																																																																										
60°S	-2.5	-2.1	-2.2	-2.2	-1.9	-1.7	-1.6	-1.7	-1.8	-1.8	-1.9	-2.0	-2.1	-2.0	-2.1	-2.3	-2.2	-2.1	-2.3	-2.4	-2.5	-2.4	-2.3	-2.2	-2.1	-2.0	-2.1	-2.1	-2.1	-2.2	-2.0	-2.1	-2.2	-2.3	-2.4	-2.5																																																																										
30°N	-4.1	-3.7	-3.3	-3.1	-2.9	-2.8	-2.9	-2.9	-3.0	-2.9	-2.8	-2.6	-2.6	-2.5	-2.6	-2.9	-3.0	-3.1	-3.3	-3.4	-3.5	-3.4	-3.4	-3.4	-3.6	-3.7	-3.8	-3.9	-3.8	-3.6	-3.3	-3.2	-3.3	-3.5	-3.8	-4.0																																																																										
60°S	-6.0	-5.9	-5.6	-5.4	-5.3	-5.3	-5.3	-5.2	-5.1	-5.0	-4.7	-4.4	-4.2	-4.1	-4.2	-4.4	-4.6	-4.9	-5.1	-5.4	-5.6	-5.7	-5.9	-6.0	-6.2	-6.4	-6.6	-6.7	-6.5	-6.2	-5.8	-5.6	-5.6	-5.8	-6.0																																																																											
30°N	-7.9	-7.9	-7.9	-7.9	-7.8	-7.6	-7.3	-7.0	-6.7	-6.5	-6.3	-6.0	-5.8	-5.7	-5.8	-6.0	-6.2	-6.4	-6.5	-6.8	-6.9	-7.1	-7.3	-7.6	-7.8	-7.9	-8.0	-8.0	-8.0	-7.9	-7.8	-7.9	-7.9	-7.9	-7.9																																																																											
60°S	-9.4	-9.3	-9.2	-9.1	-8.8	-8.6	-8.3	-8.0	-7.7	-7.5	-7.4	-7.2	-7.0	-7.0	-6.9	-6.8	-6.8	-6.8	-6.6	-6.6	-6.7	-6.7	-6.8	-7.1	-7.5	-7.6	-7.5	-7.5	-7.7	-8.0	-8.2	-8.4	-8.7	-9.0	-9.2	-9.3																																																																										
30°N	-9.6	-9.6	-9.6	-9.5	-9.3	-9.2	-9.0	-8.8	-8.7	-8.6	-8.6	-8.7	-8.6	-8.5	-8.4	-8.2	-8.1	-8.0	-7.9	-7.8	-7.7	-7.6	-7.5	-7.5	-7.6	-7.7	-7.9	-8.1	-8.3	-8.5	-8.8	-9.1	-9.3	-9.4	-9.5	-9.6																																																																										
60°S	-9.6	-9.6	-9.6	-9.5	-9.3	-9.2	-9.0	-8.8	-8.7	-8.6	-8.6	-8.7	-8.6	-8.5	-8.4	-8.2	-8.1	-8.0	-7.9	-7.8	-7.7	-7.6	-7.5	-7.5	-7.6	-7.7	-7.9	-8.1	-8.3	-8.5	-8.8	-9.1	-9.3	-9.4	-9.5	-9.6																																																																										

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
 Channel: HIRS4 (400 hPa)
 NOAA15, using all observations



Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



Figure 35. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations



Channel: AMSUA-7 (300 hPa)



Figure 39. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations



Figure 40. ATOVS mean daily count. DECEMBER 2004
 NOAA16, using all observations
 Global average number of observations in 24 hours = 585846



Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations

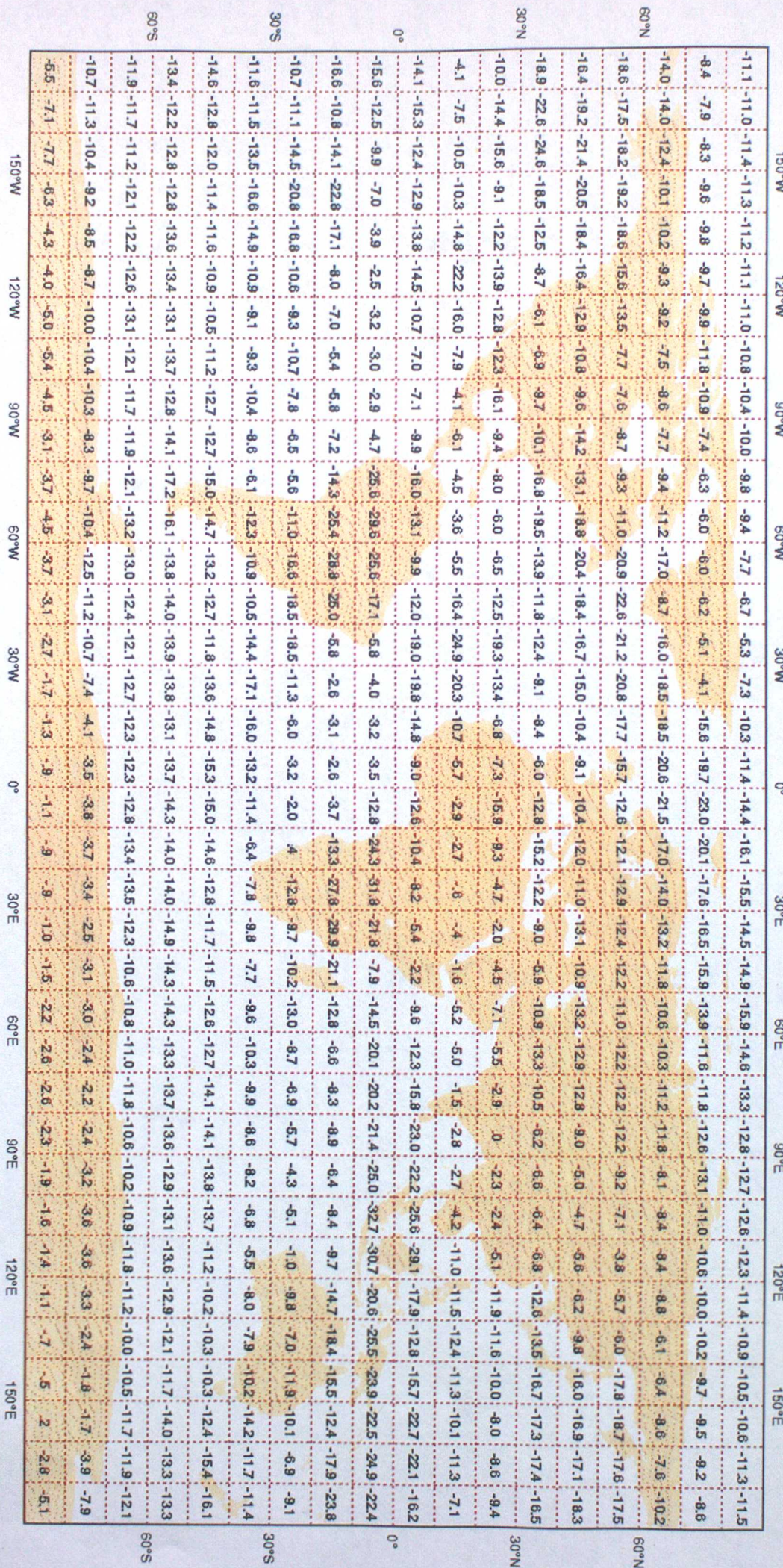


Figure 42. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS8 (Surface)
NOAA16, using all observations

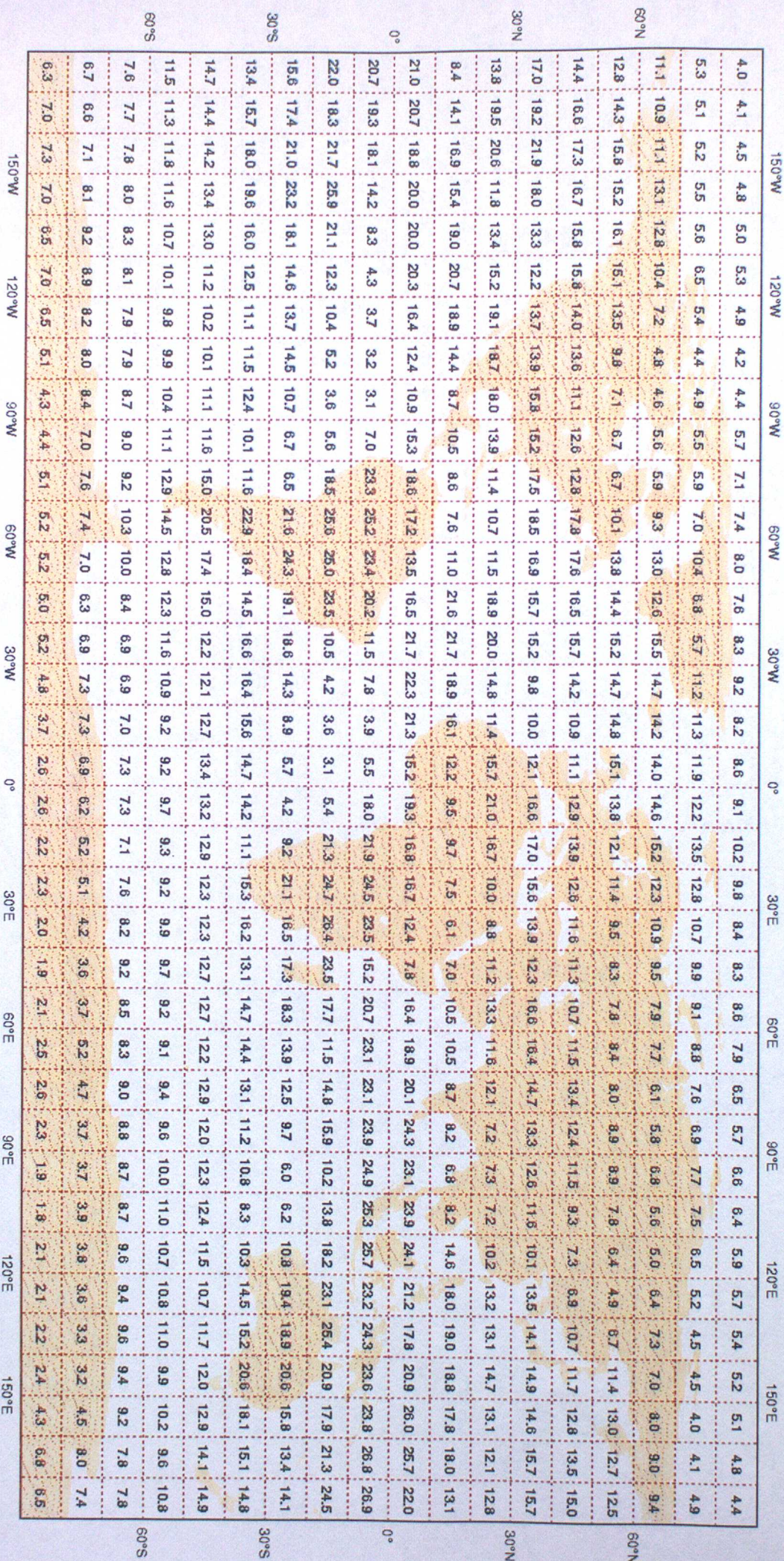


Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
 Channel: HIRS15 (700 hPa)
 NOAA16, using all observations



Figure 44. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
 Channel: HIRS4 (400 hPa)
 NOAA16, using all observations



Figure 48. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: HIRS4 (400 hPa)
NOAA16, using all observations

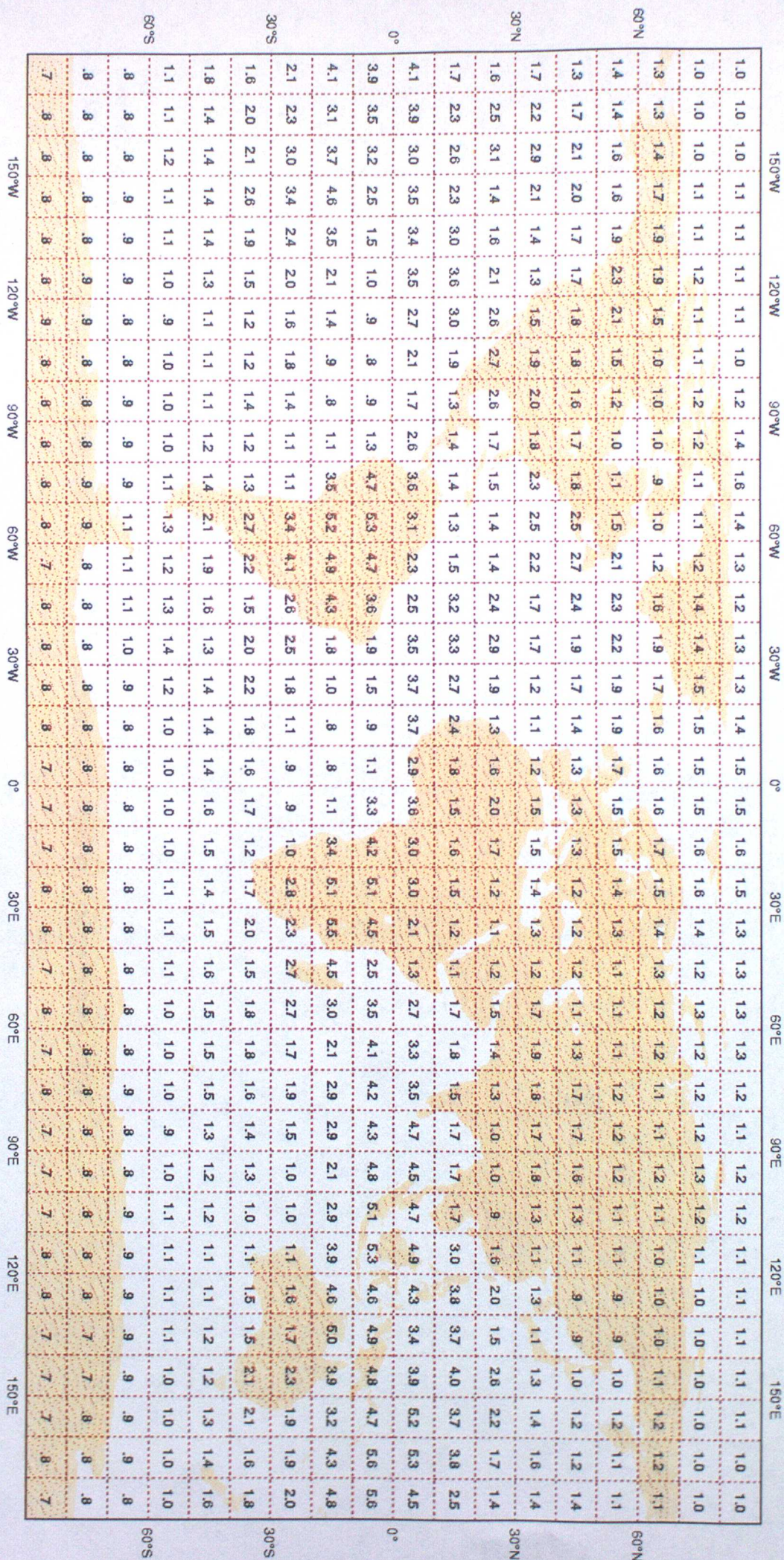


Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



Figure 50. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



Figure 52. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



NOAA16, using all observations



Figure 54. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2004
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations



TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures		
Period		:One calendar month.
Data monitored		:Reports from each unique identifier for drifting buoy.
Area monitored		:10°N - 80°N, 85°W - 0°W
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:All hours combined.
Elements monitored		:Mean sea-level pressure (hPa) :Wind speed (m s^{-1}) :Wind direction (degrees)
Parameters monitored	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors. N.B. A positive bias indicates the wind observation is veered to the background
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors
GROSS ERROR LIMITS	:15 hPa (pressure) :25 m s^{-1} (Vector Wind)	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
13534	34.0	-30.1	P	726	0	2	0.8	-0.2	0.9
41520	21.0	-62.7	P	1057	0	67	0.5	0.0	0.5
41521	19.0	-60.6	P	1002	0	66	0.6	-1.1	1.2
41539	24.2	-66.3	P	559	0	0	0.5	1.1	1.2
41540	39.0	-45.3	P	531	0	1	0.9	0.8	1.2
41541	24.6	-76.6	P	549	0	0	0.5	1.2	1.3
41542	28.0	-72.5	P	553	0	0	0.6	-0.2	0.6
41543	25.2	-71.1	P	548	0	0	0.5	-0.3	0.6
41544	20.9	-60.0	P	528	0	0	0.5	0.2	0.6
41545	23.5	-68.6	P	540	0	0	0.5	0.5	0.7
41548	18.8	-56.9	P	1005	0	40	0.8	0.8	1.1
41549	18.5	-56.7	P	1078	0	46	0.7	0.9	1.1
41550	18.8	-82.2	P	1027	0	40	0.8	1.1	1.4
41551	13.9	-58.9	P	970	0	40	0.8	0.3	0.9
41590	25.8	-53.7	P	206	0	0	0.6	1.6	1.7
41595	25.2	-44.1	P	524	0	7	0.6	1.2	1.4
41600	39.4	-42.9	P	686	0	15	1.1	-0.5	1.2
41601	43.8	-36.1	P	626	0	1	0.9	-0.4	1.0
41631	28.4	-69.8	P	389	0	2	1.1	0.7	1.3
41655	32.1	-59.2	P	65	0	2	1.4	1.0	1.7
41663	17.3	-62.7	P	978	0	67	0.7	-1.9	2.0
41664	15.6	-58.9	P	1211	0	81	0.7	-1.2	1.4
41665	15.0	-54.4	P	1241	0	68	0.7	-1.0	1.2
41666	16.0	-59.7	P	1238	0	68	0.7	-1.3	1.5
41920	21.9	-64.4	P	230	2	4	1.2	-0.1	1.2
41921	24.8	-73.1	P	234	1	100	3.2	6.4	7.1
41922	21.6	-71.4	P	211	0	1	1.1	-0.8	1.4
41924	24.3	-72.6	P	249	0	1	0.6	-0.1	0.6
41925	23.4	-72.5	P	223	1	4	0.7	-0.2	0.8
41926	23.1	-68.7	P	246	1	4	1.1	-0.1	1.1
41927	27.0	-70.1	P	250	1	2	0.5	-0.5	0.7
41928	21.2	-73.4	P	125	1	1	0.6	-0.6	0.8
41929	27.1	-74.0	P	274	0	4	0.9	0.1	0.9
41930	24.1	-70.1	P	184	0	2	0.6	-0.3	0.7
41931	29.1	-77.1	P	249	2	4	0.6	-0.1	0.6
41932	22.7	-66.9	P	261	1	2	0.5	-0.2	0.5
41934	23.1	-62.0	P	273	0	4	1.3	-0.8	1.5
41935	23.4	-68.5	P	235	0	2	0.6	-0.4	0.7
41939	36.2	-70.7	P	280	0	12	1.2	-3.0	3.2
41943	25.6	-73.9	P	218	0	16	2.9	-0.5	2.9
41944	36.8	-64.6	P	18	0	0	1.1	2.2	2.4
44547	57.8	-29.8	P	640	0	5	1.2	-0.6	1.4
44549	51.2	-40.8	P	631	2	4	1.2	0.3	1.3
44550	49.9	-44.5	P	643	0	1	1.0	-0.1	1.0
44601	45.7	-49.4	P	683	0	1	1.0	-1.2	1.6
44607	40.5	-62.1	P	530	0	2	1.1	0.1	1.1
44608	40.8	-55.9	P	550	0	1	1.0	-0.2	1.0
44612	55.6	-24.7	P	620	0	0	0.8	-0.2	0.8
44617	49.9	-29.8	P	638	0	12	0.9	0.3	0.9
44623	30.0	-51.1	P	709	3	9	2.3	-0.6	2.4
44624	48.2	-29.0	P	558	0	2	1.2	1.0	1.5
44625	59.6	-31.0	P	644	0	8	2.3	-1.2	2.6
44627	43.6	-20.2	P	538	0	0	0.9	0.2	0.9
44628	32.5	-23.3	P	678	0	1	0.5	-0.3	0.6
44630	27.2	-41.9	P	710	0	2	0.6	0.2	0.7
44721	53.7	-45.4	P	720	0	1	0.8	0.2	0.8

44722	43.4	-47.1	P	715	0	1	0.7	-0.2	0.8
44723	56.4	-39.2	P	713	0	2	0.8	-0.4	0.9
44724	53.4	-40.2	P	45	0	0	0.6	0.1	0.7
44725	51.4	-49.3	P	305	0	2	0.8	0.2	0.8

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
44742	41.3	-16.9	P	543	0	0	0.5	-0.4	0.6
44743	43.4	-12.5	P	479	0	0	0.5	-0.1	0.5
44745	50.6	-16.2	P	740	0	4	0.6	-0.7	0.9
44761	54.7	-15.4	P	488	0	22	1.0	0.3	1.1
44766	49.8	-8.1	P	545	0	1	0.5	-0.5	0.7
44773	62.2	-27.1	P	307	0	27	1.2	-0.5	1.3
44775	50.6	-42.9	P	336	0	23	1.3	-1.0	1.6
44777	25.4	-52.2	P	290	0	16	0.5	-0.3	0.6
44778	29.6	-35.0	P	222	0	14	0.5	-0.3	0.6
44779	52.8	-24.7	P	321	0	26	1.3	-0.8	1.5
62510	37.8	-25.2	P	725	0	1	0.6	-0.4	0.7
62511	49.3	-13.1	P	639	0	1	0.8	0.5	0.9
62512	46.2	-13.5	P	714	0	2	0.5	0.8	0.9
62556	36.3	-16.4	P	1183	2	44	0.6	-0.2	0.6
62557	40.9	-10.6	P	699	0	1	0.6	0.0	0.6
62558	38.1	-18.4	P	713	0	2	0.5	-0.2	0.5
62560	42.9	-15.2	P	649	0	1	0.6	0.3	0.7
62562	51.4	-17.0	P	1039	0	39	0.9	0.3	1.0
62563	54.6	-16.8	P	701	0	2	0.6	-0.3	0.7
62564	42.2	-18.4	P	711	0	1	0.4	0.0	0.4
62565	54.2	-12.1	P	686	0	2	0.9	-0.1	0.9
62566	56.4	-26.6	P	706	0	2	1.3	-0.3	1.4
62694	51.6	-14.8	P	532	0	1	0.9	0.1	0.9
62801	30.3	-32.3	P	763	0	15	0.8	0.0	0.8
64524	60.3	-49.6	P	658	2	12	2.6	1.5	3.0
64608	62.5	-59.8	P	672	0	4	1.9	0.6	2.0
64609	63.1	-31.6	P	714	0	1	1.0	0.0	1.0
64610	62.6	-20.4	P	686	0	1	0.9	0.2	0.9
65599	59.2	-30.1	P	111	0	18	0.7	-0.3	0.8
65600	60.5	-14.9	P	129	1	17	0.9	-0.1	0.9

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41539	24.2	-66.3	SPEED	549	0	100	1.5	-1.2	1.9
41540	39.0	-45.3	SPEED	513	0	100	2.2	-0.2	2.2
41541	24.6	-76.6	SPEED	365	0	100	2.4	1.1	2.6
41542	28.0	-72.5	SPEED	533	0	100	2.0	-0.3	2.1
41543	25.2	-71.1	SPEED	534	0	100	1.7	0.3	1.7
41544	20.9	-60.0	SPEED	507	0	100	1.7	-0.7	1.8
41545	23.5	-68.6	SPEED	529	0	100	1.7	-0.2	1.7
41590	25.8	-53.7	SPEED	104	0	100	3.1	4.1	5.1
41595	25.2	-44.1	SPEED	493	0	100	2.2	-1.9	2.9
41920	21.9	-64.4	SPEED	19	32	100	8.2	2.1	8.5
41921	24.8	-73.1	SPEED	224	2	100	3.1	-5.2	6.0
41922	21.6	-71.4	SPEED	208	49	100	11.6	0.0	11.6
41924	24.3	-72.6	SPEED	8	50	100	3.1	-3.1	4.4
41925	23.4	-72.5	SPEED	217	1	100	3.1	-5.4	6.3
41926	23.1	-68.7	SPEED	223	1	100	2.5	0.8	2.6
41927	27.0	-70.1	SPEED	2	0	100	0.4	-1.2	1.3
41928	21.2	-73.4	SPEED	1	100	0			
41929	27.1	-74.0	SPEED	4	0	100	6.2	7.2	9.5
41930	24.1	-70.1	SPEED	2	50	100	0.0	8.0	8.0
41931	29.1	-77.1	SPEED	2	50	100	0.0	23.7	23.7

41934	23.1	-62.0	SPEED	23	17	100	0.8	0.8	1.2
62511	49.3	-13.1	SPEED	589	0	100	2.3	2.2	3.2
62565	54.2	-12.1	SPEED	606	0	100	2.7	3.3	4.2
62566	56.4	-26.6	SPEED	657	0	100	2.5	0.5	2.6

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
41539	24.2	-66.3	DIRN.	338	0	0	14.5	-0.9	14.6
41540	39.0	-45.3	DIRN.	397	0	0	20.8	-6.5	21.8
41541	24.6	-76.6	DIRN.	225	0	0	20.6	-10.1	23.0
41542	28.0	-72.5	DIRN.	304	0	0	22.9	11.8	25.8
41543	25.2	-71.1	DIRN.	356	0	0	12.7	1.1	12.8
41544	20.9	-60.0	DIRN.	381	0	0	16.8	9.8	19.5
41545	23.5	-68.6	DIRN.	345	0	0	13.5	-4.7	14.3
41590	25.8	-53.7	DIRN.	91	0	0	20.2	-9.0	22.1
41595	25.2	-44.1	DIRN.	218	0	0	10.8	-28.7	30.6
41920	21.9	-64.4	DIRN.	12	50	0	79.0	-19.2	81.3
41921	24.8	-73.1	DIRN.	11	45	0	84.9	14.8	86.2
41922	21.6	-71.4	DIRN.	122	83	0	29.9	-0.7	29.9
41924	24.3	-72.6	DIRN.	5	80	0	0.0	-15.6	15.6
41925	23.4	-72.5	DIRN.	6	33	0	13.6	23.0	26.8
41926	23.1	-68.7	DIRN.	165	2	0	25.7	3.4	26.0
41927	27.0	-70.1	DIRN.	1	0	0	0.0	-45.9	45.9
41928	21.2	-73.4	DIRN.	1	100	0			
41929	27.1	-74.0	DIRN.	4	0	0	83.2	1.2	83.2
41930	24.1	-70.1	DIRN.	2	50	0	0.0	37.8	37.8
41931	29.1	-77.1	DIRN.	2	50	0	0.0	5.3	5.3
41934	23.1	-62.0	DIRN.	4	100	0			
62511	49.3	-13.1	DIRN.	552	0	0	15.6	3.0	15.9
62565	54.2	-12.1	DIRN.	582	0	0	18.4	-8.1	20.1
62566	56.4	-26.6	DIRN.	616	0	0	16.5	-1.6	16.5

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures:		
Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s ⁻¹
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s ⁻¹ Vector Wind	
SELECTION CRITERIA	:N REP ≥ 20	

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	BIAS
AAL	880	0	6	1.4	0.1	613	0	7	0	8.4	0.1
ACA	867	1	4	1.5	-0.1	554	1	4	0	7.7	0.4
AEA	507	0	5	1.5	0.1	416	1	6	0	10.5	-0.8
AFL	549	0	3	1.7	0.3	317	0	4	0	6.7	0.0
AFR	776	0	6	1.5	0.4	745	0	9	0	9.2	-0.3
AJM	230	0	2	1.3	-0.2	189	0	5	0	10.3	-0.8
AMT	98	1	5	1.5	0.6	91	1	9	0	9.2	-1.5
AMX	332	2	3	1.4	0.2	308	0	9	0	13.1	-1.5
AUA	38	0	26	3.3	2.0	37	8	19	0	5.5	-0.6
AVA	48	0	0	1.9	0.9	47	0	100	0	12.1	0.5
AZA	573	1	10	2.4	0.7	453	0	7	0	8.1	0.4
BAL	248	0	11	1.5	0.0	248	2	12	0	7.0	0.3
BAW	496	1	14	1.8	-0.5	323	0	14	0	7.9	0.3
BHP	34	0	6	1.6	-0.5	28	0	7	0	10.1	-2.4
BPA	291	0	100	2.8	1.5	286	2	17	0	10.1	-1.4
BWA	190	0	6	1.8	-0.1	158	1	8	0	10.7	-0.2
CFC	60	0	7	1.4	0.2	57	0	11	0	9.9	1.1
CFG	510	0	3	1.3	0.1	456	0	6	0	9.3	-0.7
CKS	160	1	6	1.8	0.4	121	0	14	0	13.2	-0.2
CLX	259	0	2	1.6	-0.6	178	0	2	0	7.0	-0.2
COA	156	0	45	1.3	-0.1	116	1	54	0	12.1	-0.9
CRL	402	1	4	1.6	0.7	378	0	36	0	9.5	-0.1
CSD	47	0	2	2.2	0.4	33	0	6	0	9.9	1.5
CUB	126	2	6	1.8	-0.3	110	0	7	0	10.8	-0.8
DAL	1092	0	8	1.5	-0.3	771	0	10	0	8.1	0.5
DCS	29	0	7	2.1	0.2	20	0	10	0	8.0	2.6
DHL	153	1	100	6.2	-5.9	88	0	30	0	15.1	0.5
DLH	457	0	11	1.5	0.2	446	0	11	0	7.3	0.2
DRD	69	6	6	1.4	0.1	67	0	100	0	10.6	-0.1
EDW	44	0	2	1.9	0.0	37	0	32	0	4.5	0.8
EEZ	68	4	15	1.8	0.3	67	0	16	0	9.6	1.8
EIA	227	0	12	1.3	0.5	211	1	100	0	21.3	4.2
ELY	68	0	1	1.2	0.0	58	0	2	0	6.2	-0.2
ETH	28	0	0	1.3	0.3	25	0	0	0	4.7	0.1
FCA	85	2	5	1.4	0.3	69	1	9	0	11.6	-0.9
FDX	518	0	36	1.4	0.3	372	0	34	0	8.3	0.3
FIN	246	1	6	1.7	0.0	181	0	4	0	6.6	0.5
FWI	264	2	6	1.7	-0.2	258	1	7	0	9.0	-0.5
GCO	147	3	18	1.4	0.3	141	1	23	0	11.1	0.6
GRL	69	1	1	1.7	0.5	52	0	0	0	4.3	0.8
GTI	165	1	22	2.5	1.3	151	1	21	0	9.7	-0.1
HXL	256	0	4	1.3	-0.1	204	0	5	0	11.2	-1.2
IBE	1505	1	7	1.6	0.4	1497	0	11	0	10.5	-1.2
ICE	868	0	4	1.6	-0.1	527	0	4	0	7.2	0.6
IWD	90	0	2	2.0	0.0	90	0	7	0	11.2	-0.8
KLM	727	1	2	1.4	0.0	507	0	4	0	9.2	-0.1
LAN	39	5	23	2.7	1.0	40	0	20	0	10.6	-1.7
LDI	253	1	7	1.9	0.3	208	2	9	0	10.1	-0.8
LOT	321	0	4	2.0	0.2	202	0	2	0	5.7	0.0
LTU	743	1	8	1.5	-0.1	574	1	8	0	8.4	0.2
MON	23	0	4	1.0	-0.4	20	0	5	0	12.1	1.7
MPD	141	0	3	2.0	0.6	131	0	5	0	10.9	-1.4
MPH	411	0	2	1.5	-0.5	297	1	4	0	8.6	-0.4
MYT	163	1	6	1.7	-0.1	110	1	3	0	5.3	0.7
NAO	31	0	10	2.0	0.5	25	0	8	0	7.0	0.8
NCA	31	0	3	1.5	-0.1	29	0	3	0	8.8	-0.6
NVR	43	2	2	1.1	-0.4	26	0	0	0	4.9	2.0

NWA	1400	1	4	1.7	0.3	1332	0	6	0	9.5	-0.1
OAE	249	0	8	1.4	-0.3	166	1	45	0	19.5	5.5

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				BIAS
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	
OOM	59	0	3	1.9	-1.4	47	0	2	0	4.9	0.5
PAC	150	0	11	1.4	0.1	123	0	14	0	10.2	-0.8
PLM	76	0	1	2.2	1.5	72	0	40	0	11.7	-2.3
RAM	243	0	2	1.5	0.2	179	2	51	0	13.3	-1.9
RCH	237	4	100	3.7	-1.1	184	1	100	0	14.2	-1.8
RZO	173	1	6	1.7	-0.4	157	3	38	0	13.1	-1.5
SEU	89	0	2	1.4	0.3	81	1	2	0	5.3	0.6
SLM	34	0	6	1.4	0.6	34	0	50	0	10.5	0.5
TAP	251	0	2	1.2	-0.1	196	0	43	0	11.7	-1.5
TSC	50	2	2	1.1	-0.5	36	3	8	0	13.9	-2.6
TUB	84	0	11	1.8	1.1	86	0	10	0	5.2	1.1
UAE	22	0	14	1.5	0.1	22	0	14	0	6.2	2.5
UAL	106	1	57	2.1	-0.4	93	1	56	0	13.1	3.5
UPS	722	1	52	1.9	0.4	703	1	52	0	7.8	0.4
USA	170	1	5	1.7	0.5	131	0	6	0	8.9	1.4
VIR	143	1	4	1.4	-0.1	99	1	3	0	7.0	0.8
WOA	348	0	15	1.3	0.3	301	0	17	0	9.8	0.2
XLA	43	2	5	0.7	-0.1	41	0	5	0	6.2	1.2

IDENT.	N.REP.	TEMPERATURE				N.REP.	WIND				BIAS
		PG	PR	RMS	BIAS		PG	PR	PC	RMS	
EU	30231	0	22	1.1	0.2	30229	0	22	0	4.5	0.4
N	378	4	8	2.2	0.5	255	0	5	0	8.4	1.1
US ACARS	20170	0	33	1.4	0.2	20170	0	29	0	5.2	0.4

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ASAP5	12	Z	100	5	0	31.8	31.9	2.6
EBUQ	12	Z	100	11	0	12.7	16.0	9.7
ELML7	00	Z	100	13	0	13.9	23.6	19.0
ELML7	12	Z	100	14	0	12.0	26.3	23.4
FQFL	00	Z	100	4	0	14.2	40.6	-38.0
FQFL	12	Z	100	8	0	13.1	25.7	-22.1
FQFM	00	Z	100	10	0	16.3	16.4	2.0
FQFM	12	Z	100	12	0	22.8	25.2	10.8
KHRH	00	Z	100	11	0	19.6	39.3	34.1
KHRH	12	Z	100	10	0	18.7	33.1	27.3
KRPD	00	Z	100	1	0	0.0	20.0	20.0
KRPD	12	Z	100	2	0	28.0	48.8	40.0
LDWR	00	Z	100	28	0	17.0	24.6	-17.7
LDWR	12	Z	100	27	0	17.2	21.1	-12.3
OXVH2	00	Z	100	3	1	24.8	26.4	9.0
OXVH2	12	Z	100	3	0	10.3	37.8	36.3
OXYH2	00	Z	100	5	0	21.6	21.8	3.0
OXYH2	12	Z	100	5	0	17.6	25.5	18.4
V2XM	00	Z	100	3	0	5.4	12.2	-11.0
V2XM	12	Z	100	5	0	19.2	19.2	1.0
WAAH	00	Z	100	11	0	13.0	24.7	21.0
WAAH	12	Z	100	12	0	16.3	33.3	29.1
WPKD	00	Z	100	4	0	22.7	28.4	17.0
WPKD	12	Z	100	4	0	17.6	19.0	7.3
ZCBE7	00	Z	100	10	0	8.0	12.9	10.1
ZCBE7	12	Z	100	9	1	9.9	14.5	10.7
ZCBP6	00	Z	100	9	0	22.0	28.4	18.0
ZCBP6	12	Z	100	5	1	17.0	48.6	45.6
03953	00	Z	100	28	0	11.0	11.2	2.5
03953	12	Z	100	29	0	15.8	17.8	8.2
04018	00	Z	100	29	0	13.6	15.2	6.8
04018	12	Z	100	30	0	15.1	17.7	9.1
04220	00	Z	100	27	1	14.2	14.2	-0.3
04220	12	Z	100	29	1	8.6	9.6	4.1
04270	00	Z	100	27	0	23.9	24.0	-2.6
04270	12	Z	100	28	0	24.3	25.2	6.5
04339	00	Z	100	29	0	11.5	11.6	1.2
04339	12	Z	100	29	0	16.4	17.3	5.7
04360	00	Z	100	27	0	12.9	14.8	7.3
04360	12	Z	100	27	0	14.3	15.3	5.4
08001	00	Z	100	23	1	17.4	20.5	-10.8
08001	12	Z	100	25	0	21.1	23.5	-10.3
08508	00	Z	100	11	0	9.1	21.0	18.9
08508	12	Z	100	24	0	14.4	32.8	29.4
08522	12	Z	100	28	0	14.2	31.1	27.6
08594	12	Z	100	20	0	12.2	13.2	5.0
71600	00	Z	100	29	0	10.9	11.3	-3.0
71600	12	Z	100	30	0	15.3	16.7	-6.8
72201	00	Z	100	28	0	9.4	27.7	26.1
72201	12	Z	100	30	0	10.2	24.6	22.4
72402	00	Z	100	26	0	11.8	20.5	16.8
72402	12	Z	100	29	0	15.3	16.3	5.7
74494	00	Z	100	27	0	16.0	16.4	3.3
74494	12	Z	100	25	0	21.2	22.6	-8.1
78016	00	Z	100	28	0	6.1	32.9	32.3

78016 12 Z 100 24 0 10.7 38.1 36.5

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.1	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ASAP5	12	Z	500	5	0	31.5	31.8	4.8
EBUQ	12	Z	500	17	0	8.1	8.3	-1.6
ELML7	00	Z	500	13	0	11.2	11.4	1.9
ELML7	12	Z	500	15	0	7.7	9.3	5.2
FQFL	00	Z	500	6	0	13.6	30.5	-27.3
FQFL	12	Z	500	8	0	8.5	19.5	-17.5
FQFM	00	Z	500	12	0	14.5	17.7	-10.2
FQFM	12	Z	500	13	0	10.3	14.7	-10.5
KHRH	00	Z	500	13	0	9.6	16.0	12.8
KHRH	12	Z	500	14	0	10.0	16.2	12.8
KRPD	00	Z	500	1	0	0.0	13.0	13.0
KRPD	12	Z	500	2	0	5.0	11.2	-10.0
LDWR	00	Z	500	29	0	9.2	11.8	-7.5
LDWR	12	Z	500	28	0	13.2	14.8	-6.6
OXVH2	00	Z	500	3	1	5.7	6.1	2.0
OXVH2	12	Z	500	3	0	2.9	16.3	16.0
OXYH2	00	Z	500	6	0	15.3	16.3	5.5
OXYH2	12	Z	500	6	0	12.6	16.1	10.0
V2XM	00	Z	500	4	0	12.7	12.8	1.5
V2XM	12	Z	500	5	0	7.5	7.7	1.8
WAAH	00	Z	500	11	0	23.5	24.3	6.2
WAAH	12	Z	500	12	0	11.3	14.8	9.5
WPKD	00	Z	500	4	0	15.0	16.4	-6.8
WPKD	12	Z	500	4	0	17.6	21.2	-11.8
ZCBE7	00	Z	500	10	0	7.2	8.5	-4.6
ZCBE7	12	Z	500	9	1	5.8	6.0	-1.4
ZCBP6	00	Z	500	9	0	12.3	16.0	10.3
ZCBP6	12	Z	500	6	1	14.3	25.8	21.5
03953	00	Z	500	29	0	8.6	8.8	-1.8
03953	12	Z	500	30	0	6.5	6.6	-1.1
04018	00	Z	500	29	0	7.9	8.9	4.1
04018	12	Z	500	30	0	10.9	11.7	4.1
04220	00	Z	500	28	0	11.9	12.5	3.9
04220	12	Z	500	29	1	9.7	11.8	6.7
04270	00	Z	500	28	0	11.1	12.0	4.3
04270	12	Z	500	30	0	8.9	10.1	4.9
04339	00	Z	500	29	0	10.2	12.3	6.9
04339	12	Z	500	30	0	7.2	10.2	7.2
04360	00	Z	500	28	0	10.8	10.8	-0.3
04360	12	Z	500	27	0	7.8	9.1	4.6
08001	00	Z	500	24	1	8.7	15.7	-13.0
08001	12	Z	500	26	1	21.3	25.1	-13.4
08508	00	Z	500	11	0	4.8	5.0	-1.5
08508	12	Z	500	24	0	6.8	6.8	-0.2
08522	12	Z	500	29	0	7.2	7.2	1.0
08594	12	Z	500	24	0	7.4	7.8	-2.7
71600	00	Z	500	29	0	9.2	9.9	-3.5
71600	12	Z	500	30	0	8.6	10.4	-5.8
72201	00	Z	500	28	0	6.4	7.0	-2.9
72201	12	Z	500	30	0	4.5	6.5	-4.7
72402	00	Z	500	28	0	4.5	4.7	1.2
72402	12	Z	500	30	0	7.5	8.2	3.3
74494	00	Z	500	28	0	7.9	8.5	3.1
74494	12	Z	500	27	0	13.9	14.0	1.9
78016	00	Z	500	28	0	5.9	10.5	8.7

78016 12 Z 500 26 0 7.4 10.7 7.7

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s ⁻¹
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ASAP5	12	V	100	4	0	0	2.8	-1.0	-2.1
EBUQ	12	V	100	2	0	100	5.8	-0.5	-1.5
ELML7	00	V	100	12	0	100	8.9	-0.3	1.1
ELML7	12	V	100	14	0	100	10.5	-2.3	0.4
FQFL	00	V	100	5	0	0	4.6	-0.7	-1.0
FQFL	12	V	100	8	0	0	6.1	-1.3	-0.6
FQFM	00	V	100	10	0	0	4.2	0.6	-1.5
FQFM	12	V	100	12	0	0	4.8	0.3	1.1
KHRH	00	V	100	7	0	100	11.4	2.2	-1.6
KHRH	12	V	100	5	0	100	8.1	1.7	-2.6
KRPD	00	V	100	1	0	100	11.4	-11.1	2.3
KRPD	12	V	100	1	0	100	17.9	-3.1	17.6
LDWR	00	V	100	28	0	0	3.4	0.1	-1.0
LDWR	12	V	100	27	0	0	3.6	-0.2	-1.1
OXVH2	00	V	100	3	0	0	4.7	-1.7	-1.9
OXVH2	12	V	100	2	0	0	4.9	-3.9	1.0
OXYH2	12	V	100	1	0	0	11.2	-6.5	-9.1
V2XM	00	V	100	3	0	100	5.0	2.7	-0.8
V2XM	12	V	100	4	0	100	4.5	0.3	0.8
WAAH	00	V	100	6	0	100	10.6	6.4	1.9
WAAH	12	V	100	5	0	100	11.0	8.5	2.4
WPKD	00	V	100	3	0	0	7.1	-4.7	2.6
WPKD	12	V	100	4	0	25	15.5	-2.4	-4.1
ZCBE7	00	V	100	1	0	0	8.1	-6.4	5.0
ZCBE7	12	V	100	1	0	0	7.7	7.7	-0.1
ZCBP6	00	V	100	6	0	0	9.6	8.4	0.0
ZCBP6	12	V	100	4	0	0	7.5	6.7	1.5
03953	00	V	100	28	0	0	4.0	0.1	-0.4
03953	12	V	100	29	0	0	4.1	-0.8	-0.3
04018	00	V	100	28	0	0	4.0	0.0	-0.7
04018	12	V	100	29	0	0	3.3	0.7	-0.3
04220	00	V	100	21	0	0	3.1	0.3	0.4
04220	12	V	100	27	0	0	3.0	0.2	0.9
04270	00	V	100	24	0	0	5.1	-0.6	0.2
04270	12	V	100	26	0	0	5.4	0.5	0.1
04339	00	V	100	27	0	3	7.0	-0.7	0.1
04339	12	V	100	28	0	7	6.6	2.7	-0.6
04360	00	V	100	26	0	0	4.8	-1.0	1.0
04360	12	V	100	27	0	0	3.7	-1.2	0.1
08001	00	V	100	24	0	0	5.0	0.5	-0.2
08001	12	V	100	24	0	0	6.0	-1.0	-0.5
08508	00	V	100	7	0	0	3.6	-0.6	-0.7
08508	12	V	100	11	0	0	5.3	-0.6	-1.1
08522	12	V	100	28	0	0	4.2	0.2	0.4
08594	12	V	100	20	0	100	6.6	0.9	3.9
71600	00	V	100	28	0	0	5.2	-1.1	1.1
71600	12	V	100	30	0	0	4.2	0.4	-0.3
72201	00	V	100	28	0	0	4.2	0.9	0.1
72201	12	V	100	30	0	0	4.7	-0.4	0.2
72402	00	V	100	28	0	0	4.5	0.7	0.8
72402	12	V	100	29	0	0	4.9	-0.3	1.7
74494	00	V	100	23	0	100	4.1	-0.9	1.0
74494	12	V	100	25	0	100	4.2	-1.4	1.1
78016	00	V	100	28	0	0	5.4	-0.4	0.5
78016	12	V	100	24	0	4	5.7	1.7	-0.1

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: EXETER
MONTH: Dec 2004

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s ⁻¹
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ASAP5	12	V	500	4	0	0	3.3	0.8	-0.8
EBUQ	12	V	500	6	0	100	18.5	2.4	6.4
ELML7	00	V	500	11	0	100	9.8	-2.5	0.2
ELML7	12	V	500	13	0	100	9.5	-0.5	-1.3
FQFL	00	V	500	6	0	0	3.5	-0.9	-0.9
FQFL	12	V	500	8	0	0	4.0	-0.6	-0.8
FQFM	00	V	500	12	0	0	3.3	0.5	-0.7
FQFM	12	V	500	13	0	0	4.2	0.7	-0.7
KHRH	00	V	500	11	0	100	9.6	-2.4	-1.9
KHRH	12	V	500	9	0	100	10.8	-0.7	-2.6
KRPD	00	V	500	1	0	100	3.3	-1.9	2.7
KRPD	12	V	500	1	0	100	13.5	-10.1	8.9
LDWR	00	V	500	29	0	3	5.9	-0.1	0.1
LDWR	12	V	500	28	0	0	4.1	0.1	-0.3
OXVH2	00	V	500	3	1	0	4.2	-1.1	0.9
OXVH2	12	V	500	3	0	33	36.8	-4.6	18.5
OXYH2	12	V	500	1	0	0	0.9	-0.8	-0.3
V2XM	00	V	500	3	0	0	5.0	1.2	2.3
V2XM	12	V	500	5	0	0	8.4	-5.2	0.7
WAAH	00	V	500	6	0	100	11.6	5.3	1.3
WAAH	12	V	500	6	0	100	16.2	-0.3	4.5
WPKD	00	V	500	4	0	25	6.4	-1.4	-2.1
WPKD	12	V	500	4	0	0	6.2	-0.4	-1.1
ZCBE7	00	V	500	1	0	0	6.6	-6.3	2.1
ZCBE7	12	V	500	1	0	0	9.4	8.9	-2.9
ZCBP6	00	V	500	4	0	25	15.0	13.4	1.5
ZCBP6	12	V	500	5	0	0	10.2	8.8	2.3
03953	00	V	500	29	0	0	3.7	0.0	-0.2
03953	12	V	500	30	0	0	3.8	-0.1	0.3
04018	00	V	500	29	0	0	4.7	0.0	-0.1
04018	12	V	500	30	0	3	5.6	-1.1	-0.1
04220	00	V	500	27	0	0	4.3	0.5	0.7
04220	12	V	500	30	0	0	4.6	-0.4	0.0
04270	00	V	500	28	0	0	3.6	0.3	-0.3
04270	12	V	500	30	0	0	4.3	-0.4	-0.2
04339	00	V	500	24	0	0	6.4	0.3	0.3
04339	12	V	500	29	0	3	8.5	1.0	1.1
04360	00	V	500	28	0	0	4.2	0.3	-0.3
04360	12	V	500	27	0	0	5.2	-1.2	0.3
08001	00	V	500	24	0	0	4.3	0.3	0.1
08001	12	V	500	27	0	0	4.0	0.1	-0.3
08508	00	V	500	7	0	0	2.9	0.3	-1.2
08508	12	V	500	11	0	0	4.2	0.4	0.4
08522	12	V	500	28	0	0	4.1	0.8	0.1
08594	12	V	500	24	0	100	4.6	-0.1	0.5
71600	00	V	500	29	0	0	5.4	1.3	-0.8
71600	12	V	500	30	0	0	5.8	1.5	0.8
72201	00	V	500	28	0	0	2.8	-0.3	1.0
72201	12	V	500	30	0	0	3.4	0.1	-0.2
72402	00	V	500	29	0	0	2.8	-0.2	0.1
72402	12	V	500	30	0	0	4.9	0.6	-0.4
74494	00	V	500	28	0	0	4.0	-2.0	-0.5
74494	12	V	500	27	0	0	3.7	-1.1	1.1
78016	00	V	500	28	0	0	3.6	0.7	0.5
78016	12	V	500	26	0	0	4.2	0.1	1.6

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s ⁻¹
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45